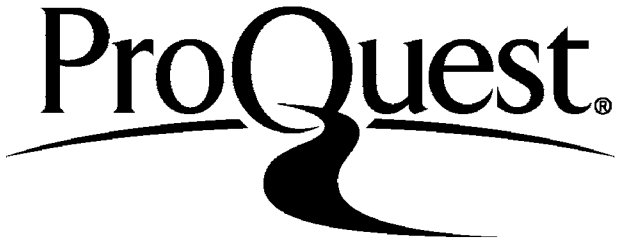
THE BOARD OF AGRICULTURE, 1793-1822,

WITH SPECIAL REFERENCE TO SIR JOHN SINCLAIR

Thesis submitted for the degree of M.A.

WINIFRED HARRISON



ABSTRACT

The Board of Agriculture was a national society in receipt of a Parliamentary grant which existed from 1793 - 1822. It was essentially the creation of a Scottish landowner, Sir John Sinclair. As the manuscript material is so thin, a chronological account is not attempted in this thesis. Instead the influence of Sinclair's ideas on its character and activities is analysed.

The introduction describes the state of farming and the climate of agricultural opinion in 1793. This is followed by an attempt to relate the concept of the Board to the furniture of Sinclair's mind, particularly his views on the economic functions of government. An account is then given of the setting up of the Board, its membership and constitution.

The next chapter is devoted to Sinclair's legislative intentions as expressed particularly in the General Enclosure Bill, and the response which they received from the landed interest. Their inclination to regard the Board as a potential agent for the removal of grievances is considered.

The remainder of the thesis is concerned with Somerville's attempt to reverse this policy and make the Board simply a national agricultural society. His 'System' and the extent to which it was implemented is described. Within this framework some account is given of the Board's correspondence, premium

policy, contact with provincial societies and the lectures of Sir Humphrey Davy.

In conclusion, an attempt is made to assess the Bœard's achievement and estimate its contribution to agricultural development in the early nineteenth century.

C O N T E N T S

CHAPTER 1 — THE BOARD AND THE CONTEMPORARY AGRICULTURAL SCENE.

CHAPTER 2 — THE BOARD AND SINCLAIR: ITS RELATION TO HIS ECONOMIC VIEWS.

CHAPTER 3 — THE ESTABLISHMENT OF THE BOARD: ITS POWERS AND CONSTITUTION.

CHAPTER 4 — SINCLAIR'S FIRST PRESIDENCY.

CHAPTER 5 — SOMERVILLE'S NEW POLICY.

CHAPTER 6 — THE BOARD AS AN AGRICULTURAL SOCIETY, ITS ACHIEVEMENT.

CHAPTER 7 — CONCLUSION.

CHAPTER 1

INTRODUCTION: THE BOARD AND THE CONTEMPORARY AGRICULTURAL SCENE

The period of the late eighteenth century, which saw the setting up of a Board of Agriculture, was one of social change which in the course of the ensuing fifty years particularly affected the position of the landowner. Its principal features were the growth of an industrial proletariat and a forceful manufacturing middle-class. Some consideration of the extent to which the landed interest was at that time aware of this threat to their economic well-being and the political influence which secured it is, therefore, of immediate relevance.

The initial impact of the rapid growth of manufactures on agriculture brought to the landed interest an access of prosperity. Whether as cause or effect, the industrial revolution was accompanied by a vast increase in population which was apparent even before the publication of ~~Matthews'~~ Malthus' Essay, to contemporary observers like Howlett and Young, despite the absence of reliable demographic statistics.(1) Most of these people sought their livelihood in the Metropolis or the towns of Lancashire and the Midlands, thus providing the farmer with a growing market for his products. Demand outstripped supply and prices rose to a greater extent than that of other commodities which

(1) Young. Political Arithmetic, 1774. p.84.
Howlett. An Examination of Dr. Price's Essay on the Population of England and Wales, 1781. p.152.

were solely affected by the contemporaneous change in the value of gold and silver. Rents correspondingly rose, particularly after 1770 until a peak was reached during the Napoleonic War. The rewards of agriculture promised to be great provided the farmer could maintain his monopoly of the home market, and there was every reason to suppose he would not find this difficult.

For many years subsequent to the development of factory industry, first of all in Lancashire and after the turn of the century in the Midlands, the constitution of the British Parliament remained unchanged. It continued to be an assembly of landowners. In the House of Lords sat the heads of the great landed families. Robert Smith, Lord Carrington, a banker, and strangely enough a President of the Board of Agriculture, was the first peer to rise from the ranks of business men.(1) Many of the nobility owned urban and mining property, but Professor Habbakuk is of the opinion that in the eighteenth century they still drew the greater part of their income from agriculture and were accordingly directly interested in its fortunes.(2) In the House of Commons a landed property qualification of £300 per annum still governed membership. The industrial magnate, like the elder Peel, who wished to enter Parliament usually became first a country gentleman. As yet little is known about the extent to which manufacturers infiltrated into the landed class by buying up estates, but Professor Habbakuk considers "the speed of this flow during the eighteenth century -

1. Habbakuk (H.J.) The European Nobility in the Eighteenth Century, 1953. edit. Goodwin (A.) p.18.
2. ibid. p.6.

is often exaggerated".[1] Halévy estimates the number of financiers, merchants, and manufacturers in the House in 1818 at just over fifty.[2] Even admitting that this figure is based on imperfect information, it may be taken to indicate that in the early nineteenth century, and presumably, therefore, at the end of the eighteenth century also, the industrial interest had made no great inroads on the political power of the landed class: nor does there seem to have been any great challenge to it before the turn of the century. Pitt's abortive proposals of 1785 for the reform of Parliament provided that some of the seats of decayed boroughs should be bought up and redistributed among the larger towns of the provinces but this was secondary to the enlargement of the representation of the Metropolis and also of the counties. In the late eighteenth century there was therefore no obvious weakening of the links between the l and the the governing class. Accordingly one might infer that the industrial revolution had as yet made no impact on the economic security of agriculture, that the contest between farmer and manufacturer had not yet begun, were it not for a few isolated remarks which suggest some anxiety on the part of the landed interest.

Most of these remarks were prompted by the Wool Bill. This was a measure introduced into the House in 1787 by representatives of those districts where the woolen industry was situated. Henry Duncombe, the member for Yorkshire, was one of its prominent supporters. Another

1. op.cit. p.16.
2. Halévy. History of the English People in The Nineteenth Century I. p. 145.

was Rolle who was also in touch with manufacturers of that county. Its intention was merely to enforce existing law. On this ground Wyndham spoke in its favour.

> "Upon the whole the bill appeared to him to be so necessary to the prosperity of this manufacturer, so consonant to the principles of existing laws and so little likely to injure the wool growers that he strongly urged the propriety of letting it go to a committee".(1)

For many years the exportation of wool had been entirely prohibited, but the manufacturers complained that a considerable quantity amounting to 13,000 packs annually had been smuggled across the channel to France.(2) To prevent this illicit traffic, the Bill proposed to require the registration of fleeces by means of machinary similar to the excise. Pitt chose to support it as a measure against smuggling. The desirability of the provisions which the law sought to enforce was not under review.

> "Mr. Pitt took notice of what had been said relative to the questions whether it would be wiser to allow an exportation of wool under certain duties, or to enforce its prohibition as effectually as possible. That question had no connection with the bill; nor did it make any part of the existing consideration;"(3)

1. Parliamentary Register. XXIII 1787-'88. p. 534.
2. ibid. p. 537.
3. ibid. p. 537.

But this, or more generally the attitude of the State towards the landed and manufacturing interest respectively as represented in the laws against the export of wool seems to have constituted the main content of the debate. A member named Harrison considered the Bill "an unnecessary boon to the manufacturers at the expense of the wool growers".(1) Sir John Thorold, Sir Robert Clayton and Sir Peter Burrell expressed a like opinion.(2) On the other side Hussey, the member for New Sarum contended that "..... in a commercial country like this the manufacturer could not be too much encouraged ....."(3) And even Pitt seems to have considered it necessary to emphasize the essential identity of interest between those engaged in agriculture and manufactures.

> "As the bill had been so amply debated he was extremely glad to find, that there was not likely to be any difference between the commercial and the landed interest on the present occasion; but that at the bottom, every gentleman, let him have taken which side of the question he would, had wished to preserve those interests, as they ever undoubtedly ought to be considered, as one and the same."(4)

Already, therefore, at the end of the eighteenth century, the landed class was beginning to regard the interest of manufacturers as a challenge to its own.

1. Parliamentary Register. op.cit. p.532.
2. ibid. p. 531, 533, 708.
3. ibid. p. 533.
4. ibid. p. 536.

To these expressions of resentment Young lent the vigour of his pen and even questioned the ability of the landed interest to protect itself in the House.

> "Hence the only safe conduct is for the landed interest to ask simply what is the subject of a Bill proposed? Wool, corn, hay etc. Who brings it in? Manufacturers, corn factors, London alderman. To ask another question is ridiculous. Don't read the bill, don't look at a single clause:- Take it for granted you are attacked or will be in its progress; - instantly appoint a watch to attend it through both Houses and give you intelligence of every step that is taken. Give you? Give who? The Landed Interest! - scattered here, there and everywhere and collected nowhere?"(1)

As a remedy for this deficiency he suggested the organisation of agricultural pressure groups by means of County Associations linked through delegates with a national body. Such associations he is careful to point out would be independent of the county representatives whom he considered "more likely to pay court to manufacturers than to oppose or detect them".(2) Young's lack of confidence in the attachment of even a landed House of Commons to the farmer's interest seems to have been shared by other enthusiasts. During the corn

1. Young. Annals of Agriculture, 1787. X. p. 407.
2. ibid. p. 409.

export and import debates of 1797 both Coke and Pulteney complained of the undue influence of the mercantile and city members.(1) On such slight evidence no conclusion about the specific preoccupations of the Landed Interest can, of course, be based; as for example that they were seriously worried about the maintenance of protection before the close of the eighteenth century. It may perhaps, however, be taken to indicate that the Landed class, particularly that part of it directly concerned with agriculture, was becoming aware that its interests might be opposed to those of other sections of the community, large enough and powerful enough to influence the action of the government and legislature. Mr. Kitson Clark remarks with reference to the 'Great Debate' of 1846 that "The Country party had probably always been weaker than the political interests that ruled Britain".(2)

The decisive factor in the repeal of the Corn Laws was not a radical change in the composition of the House of Commons favourable to the representation of the manufacturing class. It was rather the effective organisation of public opinion by the Anti-Corn Law League. No such organisation, of course, existed in the late eighteenth century, but public hostility to the Corn Laws had begun to appear on one or two occasions. Between 1756 and 1773 riots broke out whenever the price of grain rose steeply. England was gradually ceasing to be a

1. Parliamentary Register, 1797. vol II. pp. 178 and 190.
2. Clark (K.) Economic History Review, 1951-'52. 2nd series. IV. p. 11.

corn-exporting country. The long run of good harvests which were so largely responsible for the low prices of the first half of the century had broken, and at the same time the population had grown. Of this latter event there was no certain evidence. Consequently the causes of scarcity were frequently misconstrued and attributed to the manipulation of the market. The middleman became the general scapegoat, but the large farmer also was accused of engrossing. His enclosing activities had already rightly or wrongly branded him as an enemy of society in the minds of some of his contemporaries. Hence it was assumed that his concerns must be exclusively motivated by self interest. He could no longer claim to represent the entire rural community. Therein lay his weakness. In 1791, this divergence of interests between the farmer and the consumer public again found expression; this time in opposition to the Corn Bill then before Parliament. Its object was to increase the price level at which nominal duties came into operation from the 48/- of the 1775 Act to 54/-. Barnes has described this latter measure as the first of a series of Corn Laws designed to promote the sectional interests of one class".[1] But in view of the general rise in prices during the second half of the eighteenth century, the proposals were reasonable. As early as 1675 a maximum price of 53/- had been guaranteed by high protective duties. Petitions against the Bill, however, were sent by

1. Barnes (D.G.) A History of the English Corn Laws, 1660-1846. London 1930. pp. 59-60.

many of the provincial industrial towns and within the House it was attacked quite vigorously in debate. The most interesting contribution as reported in the Parliamentary Register was made by Ryder. It illustrates the fact that already the opponents of the Agricultural Interest were turning to Adam Smith for theoretical ammunition. Ryder argued that high grain prices would not benefit the landowner since all prices fluctuated with those of grain.(1) Adam Smith had first made this point when he attacked the export bounty and denied its value as an incentive to improved farming. Corn, he maintained, was the only commodity possessing real value. All other commodities were valued in terms of it. Hence it was vain for the landowner to seek to alter artificially, by legislation, the value relationships established naturally by the laws of the market between agricultural produce and other commodities.

> "The real effect of the bounty is not so much to raise the real value of corn, as to degrade the real value of silver; or to make an equal quantity of it exchange for a smaller quantity, not only of ~~corn~~ corn, but of all other home made commodities; for the money price of corn regulates that of all other home made commodities".(2)

Ricardo starting from the same premises, ie. the real value of corn drew the opposite conclusion to that of Adam Smith. Rising grain

1. Parliamentary Register. XXIX 1791. p. 60.
2. Smith (A.) Wealth of Nations. II p.11. Cannans' edit. 1930.

prices which were not part of a general price rise occasioned by a change in the value of money, benefited the agricultural interest, he maintained, at the expense of the rest of the community since higher wages, whilst providing the labourer with no additional comforts entailed lower profits.(1)

Undoubtedly, the ideas of the classical economists were to be important in helping to bring about the repeal of the Corn Laws because they presented a cogent case for unrestricted trade and convincingly attributed to corn protection the major responsibility for the prevailing distress. But in the eighteenth century, their impact on national economic policy was very limited. The Eden Treaty with France constitutes the only instance of any tariff revision. But there is evidence that the administration impressed, perhaps, by events at home and to a greater extent on the continent, with the connection between scarcity and civil disturbance, had decided that corn protection could no longer be governed solely by the claims of the landed interest. Other considerations must be taken into account. In the Report of the Lords Committee of Privy Council for Trade and Plantations published in 1790, this is clearly stated:

> "so that in the management of this trade, government ought ever to have in view not only the prosperity of the trade itself, and the interests of those concerned in it, but the subsistence of the people".(2)

1. Ricardo. On Protection to Agriculture. London 1822. pp. 41-45.
2. Annals of Agriculture. XIII 1790. p. 359.

The committee also indicated the kind of considerations the government should entertain to ensure the subsistence of the people by observing that the grain deficiencies which had occurred periodically since 1760 and particularly 1770 could only be supplied from America since Europe in ordinary years did not produce a surplus.(1) These opinions almost certainly alarmed the Landed Interest. During the second half of the eighteenth century exports of American grain into Europe were sufficiently frequent to convince Young at least that American competition could be dangerous. Writing in 1774 Young observed that in a scarce year, when import was free, the surplus of America, poured into Britain could prove dangerous to the Landed Interest since it could sell in English markets at about 35/- per quarter exclusive of freight charges as compared with 56/- for an average home-produced crop. The price ofEnglish grain because it was grown on soils l ess fertile and burdened with taxes and tithe could never be expected to fall so low.(2) In their answer to the Report of the Lords Committee of Privy Council both Sinclair and Sheffield were concerned to refute the suggestion that it would soon be necessary to augment the supply of grain with imports from America, though from motives, perhaps of political prudence, they chose to

1. Annals. op.cit. pp.358-359.

2. Young. Political Arithmetic, 1774. pp.279-282.

emphasize the danger to the nation of reliance on a supply so distant and so insecure as that of the revolted colonies, rather than the injury it would occasion to the farmer. Said Sinclair, "It depends on them, ('the Landed Interest in Parliament') whether we are to rely on the harvests of a distant continent - . With them it rests whether we shall continue an independent nation or whether we shall owe the bread we eat to the sufferance, the good-will or the bounty of a country with whom we may again be involved in rivalship and hostility."(1) Throughout his life, Sinclair, for his part, sought to make good this trust. As a Parliamentarian and a pamphleteer he consistently supported each successive agitation for increased protection. Some of the arguments he used, such as the injustice of exposing English corn to competition with that of countries less heavily taxed and free from tithes would have received the assent even of Ricardo, but for the most part he advocated and independent food supply at any cost. Like other members of the Landed Interest, he eulogised the export bounty as a means of ensuring the farmer a steady price and conversely objected to public granaries as a threat to profitable tillage.(2) Briefly, he represented an efficient system of protective duties as the most immediate measure the government could take to encourage the farmer and ensure greater agricultural productivity.

1. Sinclair. Address to the Landed Interest. 1791. p.40.

2. ibid. p. 19 and p. 29.

It must surely, however, have been clear to Sinclair that the issue of regular importation from America or elsewhere would be determined by the Landed Interest not inside but outside Parliament. High duties, were, of course, calculated to stimulate production by securing to the farmer higher prices: but their continuance itself depended as repeated suspensions of previous corn laws had demonstrated on the ability of the agricultural industry to provide adequate supplies at a price which the consumer could afford. - By the end of the eighteenth century bread had become the staple diet of the English labourer. - Both Sinclair and Sheffield in their pamphlets on the 1791 Corn Bill had prefaced their claim to additional protection by asserting the ability of the English countryside to supply the nation's grain requirements.(1) It was essential this assertion should be made good. This need it may be suggested provided the immediate impetus to Sinclair's plan for a Board of Agriculture. He first publicly proposed it in 1791, the year the new Corn Bill passed into law.

According to his son, the Rev. John Sinclair, he followed up this suggestion by attempting through the agency of Dundas to interest Pitt in the project, but without success.(2) Pitt's support was not given until 1793. Sinclair records, shortly after the Board's establishment,

1. Sinclair. Address. op.cit. pp. 8-9.
   Sheffield. Observations on the Corn Bill. 1791. pp.13-14.
2. Sinclair, (Rev. J.) Memoirs of Sir John Sinclair. 1837. II. p.48.

"that all my efforts would have been fruitless had he not latterly exerted both his influence and his talents in support of the measure".(1) Young attributes this encouragement to the indebtedness which Pitt felt towards him for the assistance he had given with the issue of exchequer bills during the currency crisis in the Spring of that year.(2) It is also possible, however, that Pitt was influenced by the outbreak of hostilities in February and the consequent threat to grain imports. Events in France had demonstrated the causal connection between food shortage and mob violence. Moreover two years earlier, when the 1791 Corn Bill was in progress, Sinclair had assured him that a mere 15,000 acres under wheat and 75,000 under barley would more than cover the average imports of each, respectively, during the eighteen years preceeding 1789.(3) During the first ten years of its existence because of the scarcities of 1795-'6 and 1800-'01, occasioned by bad harvests, much of the Board's attention was devoted to this problem, of rapidly augmenting the food supply.

Sinclair's confidence in the capacity of the land to produce more was well founded. The resources of the country at the end of the eighteenth century were more than adequate to the required increase

1. Communications to the Board of Agriculture. 1797. I. p.ix.
2. Young. On the advantages which have resulted from ..... a Board of Agriculture. Lond. 1809. p.4.
3. Sinclair. Address to the Landed Interest. London 1791. pp.16-17.

in grain production, which, though disturbing to contemporaries was small. Of course the agricultural surface of England was not uniformily devoted to tillage. East Anglia, particularly where the Norfolk system prevailed, was intensively cropped, but elsewhere the land was frequently better suited to grass. The South Western counties, Yorkshire and the Midlands were all grazing areas. Marshall describes the rotation prevalent there as a system of temporary leys or alternate tillage and grassland. Due to the recent date of enclosure at the time when he was writing, this rotation had received no definite form in Yorkshire, but in the Midlands it was well established. Oats were sown on a six or seven year ley and succeeded by wheat and barley after which the land was returned to grass.(1) Corn crops were, therefore, taken for three out of every nine or ten years. A similar system was followed in Devon and parts of Somerset.(2)

The principal products of these areas were meat and dairy produce. From the midland district cattle and sheep, particularly the New Leicesters, were sent to Birmingham and the Smithfield market, wool to Northampton and the Yorkshire mill towns and cheese to the industrial towns of the North.(3) Yorkshire (~~Vale of Evesham~~ Vale of Pickering) sent to London via Hull prime butter and bacon: that of lesser quality was marketed in the manufacturing towns of the West Riding.(4)

1. Marshall (W.) Works. vo. V. 1790 p. 187.
2. ibid. IX. 1796 p. 203.
3. ibid. V. pp. 229, 230 and 448.
4. ibid. XI. 1788. p. 409.

Kent and Middlesex provide two other instances of specialisation. The former was noted for its orchards and hopfields and the latter for its market gardens.

Yet, within the existing pattern of cultivation there was ample room for the expansion of wheat production. Many acres of land were under-cultivated. Many more were not cultivated at all. Contemporary agriculturists were preoccupied with both problems. To a certain extent they were both occasioned by deficiencies in the mechanical equipment of the agricultural industry. Broadcast sowing was still almost universal throughout the kingdom, because in the absence of an efficient drill, it remained the best system. In areas, particularly with a heavy soil, a plough had still to be designed which was both serviceable and easy to draw. No satisfactory alternative to the brush- and stone-filled drains constructed by hand had yet been devised nor was geological knowledge sufficiently advanced to enable them to be laid with accuracy. Hence the difficulty of cultivating much of the land that lay waste. Large areas still remained in this state, particularly in Northumberland, Cumberland and Westmoreland, in the Fens and the border counties ofWales. "You may draw a line", wrote Young in 1773, "from the north point ofDerbyshire to the extremity of Northumberland, of 150 miles as the crow flies which shall be entirely across wastelands: the exception of small cultivation spots very trifling".(1)

1. Young. Observations on the Present State of Waste Lands of Great Britain.

Much could, however, be done to improve farming by a more general application of existing knowledge. The husbandry of the country at large was greatly inferior to that of particular districts and individuals. It was this fact which both Marshall and Young noted with concern. In Devon and Leicestershire, three corn crops were still taken in succession. Even when roots and pulse were introduced into the rotation their value as a preparation for a specific crop was frequently misunderstood. Thus turnips would be grown after rather than before a crop of barley and beans likewise with wheat. Hoeing had not yet established itself in the accepted system of tillage. It was still erratically practised. Marshall remarks that turnips were seldom hoed either in the Midland or South Western counties.(1) Young deplored the Wiltshire bean fallows for the same reason.

> "In Kent and Essex nothing can justly be said in opposition to the practice, but in Wiltshire the case is different; good husbandry in most particulars is in its infancy and the farmers are not at all hurt at weedy crops and exhausted land".(2)

In the art of arable cultivation the West country undoubtedly lagged behind East Anglia and Kent but in the management of grassland it led the way. For centuries the meadows ofSomerset, Devon

1. Marshall. Works VI. 1790 pp. 9-10.
2. Young. Tours in England and Wales. L.S.E. Reprints of Scarce Tracts, no. 14. 1932. p.40.

and Wiltshire had been improved by watering, and yet Marshall remarked that "perhaps not half the lands ~~is~~ capable of enjoying this admirable improvement enjoy it at present".(1)

Of all English counties, Cambridge, despite its proximity to Norfolk, was the least well farmed. The survival of a considerable acreage in open field, probably hampered improvement. "Great tracts of land", wrote Young, "well adapted to sainfoin, but not an acre more sown than ten years ago; and streams that call aloud for irrigation without a single acre of watered meadow, such supineness is dreadful".(2)

There were various reasons for this disparity between the practice of one farmer and another. Agriculture is a widely dispersed industry and in an age when communications were still primitive, knowledge spread slowly. The methods of one district, moreover, were not always suited to the conditions of another. Marshall acknowledged that the turnip husbandry of Norfolk could not be applied with equal success to the heavy clays of Leicestershire.(3) Although enclosure was well advanced by the end of the eighteenth century, large areas of open field still existed where innovations were difficult to introduce. On enclosed land, farmers frequently lacked the money or the skill to carry out improvements. Some were undoubtedly tempted to occupy farms too big

1. Marshall. Works IX. 1796 p. 207.
2. Young. 'Tours in England andWales' p. 203.
3. Marshall. Works V. 1790. pp. 254-255.

for them by the prospect of large profits from corn growing. "That inclosures have most generally been mismanaged may evidently be seen by their present condition", wrote Thomas Stone, "gentlemen of landed property, having in view the immediate increase of their rentals, have - hastily set about the business - so that in some cases, poor thin stapled clays have been inclosed; which will not admit of any material alteration from the ancient mode of husbandry, or by any means answer the expenses of the business; in other cases the lands have been laid out in very large farms and let to persons incompetent to the occupation of them as well in point of property as in skill to apply the soil to its right use".(1) Above all, however, farmers were suspicious of new methods without ample proof of their utility.

> "But the misfortune is, in these cases, that farmers who have not been used to any practice in husbandry will not be persuaded into it: It requires at least a century to spread a new but really useful practice through a single country. Folding sheep was known in Henry VIII's reign and has not yet travelled quite through the kingdom. Hoeing of turnips is 150 years old and not yet practised in one half of the kingdom".(2)

Such deficiencies in the mechanical and theoretical equipment of the farmer were not unheeded by contemporary enthusiasts. In

1. Stone (T.) Suggestions for rendering the Inclosure --- riches. 1787. p. 81.

2. Young. Essays on the State of the British Empire.

the second half of the eighteenth century a national society began to encourage improvements in the skill of the farmer and the implement maker. This was the Society of Arts. It was established by William Shipley in 1754 as a national institution for the encouragement of Arts, Manufactures and Commerce, but during the first fifty years of its existence it devoted a considerable part of its resources to agriculture. The activities of the new society consisted from the first in offering and awarding premiums or prizes by means of which it sought to direct attention to specific objects.

Sinclair's proposed institution was not intended to duplicate these proceedings. He envisaged it as an advisory body, endowed with public authority, which should concern itself with the state of the agricultural industry throughout the country as one unit. This conception will be considered more fully in the next chapter in relation to Sinclair's general views on the economic functions of government.

CHAPTER 2

THE BOARD AND SINCLAIR: ITS RELATION TO HIS ECONOMIC VIEWS

Sir John Sinclair was a Scottish landowner. He was born at Ulbster, Caithness in 1754. His "ruling passions" were described by the Edinburgh Review in 1803 as a "zeal to merit the public approbation" combined with a "readiness to save his country bestowing the applauses he has deserved".(1) There is much truth in this. Sinclair loved to serve conspicuously. At the age of eighteen as the young laird of Thurso, he levied the statute labour of the neighbourhood to build in one day a carriage road over Ben Cheilt, a hill in the centre of Caithness which had long been considered impassable. The feat was accomplished, though we are not told how long the road lasted. On entering Parliament he lent his support to a measure for a repeal of the prohibition of Highland dress and at the earliest opportunity proceeded through Scotland in full costume.(2)

Whenever he gave his mind to any subject he committed his thoughts to paper and printed them. As a young man he submitted to the judgement of Adam Smith some 'Lucubrations' on the Sabbath and received the following reply:

1. Edinburgh Review. 1803. vol. II p.208.
2. Sinclair (Rev. J.) Memoirs of Sir John Sinclair. 1837. I. p. 23 and p. 91.

> "Your work is very ably written; but I advise you not to publish it; for rest assured that the Sabbath, as a political institution, is of inestimable value, independently of its claims to divine authority".(1)

In later life there was no mentor to lay a restraining hand and Sinclair's cogitations invariably resulted in a pamphlet which he circulated among the notables of the day. Among others he sent his 'Lucubrations on Reform' written in 1782 to Dr. Price and Lord Shelborne, his 'Hints on the state of our Finances' written in 1783 to Dr. Price and Sir Joseph Yorke, Ambassador at the Hague, and his 'Specimens of the Statistical Reports' written in 1791 to Lord Auckland, General Washington, Professor Zimmerman and Count Hertzberg.(2) These are only a few selected examples. Sinclair continued this practice throughout his life. Indeed his printed correspondence consists largely of acknowledgements to these communications. In reply to one of them Fox wrote, "I have not yet had time even to look at the papers but would not delay returning you my thanks for your communication". "This", Sinclair comments, "is a very convenient system for a statesman to adopt merely acknowledging the receipt of papers, promising to read them and avoiding giving any opinion of their contents".(3) Sinclair's

1. Sinclair (Rev. J.) op.cit. p.36.
2. ibid. p. 96 and pp. 103-104 also Correspondence of Sir John Sinclair, 1831. vol. I. pp.286-290.
3. ibid. p. 96.

literary 'Hints' must have been the most neglected ever given, though his recipients were usually courteous enough to send a gratifying reply.

But Sinclair's activities were not prompted solely, or even primarily, by a desire for public eminence. Behind his publications and behind his plan for a Board of Agriculture was the earnest conviction that all improvement whatsoever proceeded from fuller knowledge. In the seventeenth and eighteenth century detailed inquiry in the field of natural science had produced outstanding results. Sinclair was anxious to develop a science of political economy by the same methods; to ground social improvement on ascertained fact. Statistics, not farming, was the supreme interest of his life; therein lies his real claim to immortality. Of course, Sinclair was not a lone pioneer blazing a new trail. The periodic shortages of the late eighteenth century had created an awareness that some computation of the size of the population was desirable. The census of 1801 did not just happen. Earlier writers, notably Sir William Petty and Gregory King had been interested in quantitative factual information of a political and social nature. ButSinclair seems to have made the most comprehensive attempt since the Domesday survey to describe in terms of facts and figures the social situation of a specific locality. This, notwithstanding its defects, he did in the 'Statistical Account of Scotland'. It was, presumably, in recognition of this that, in 1834, as an old man of eighty, he was chosen to be an

'Original Member of the Statistical Society of London' in the honoured company of Malthus, Babbage, Richard Jones, McCulloch, Porter and Thomas Tooke.(1)

Sinclair's interest in this subject originated with his continental tour in 1786. Characteristically, and unlike most eighteenth century gentlemen, he chose to visit not Italy with its antiquities and art treasures but the countries of Northern Europe with their more utilitarian attractions. In the course of his journey he met several notabilities - Count Bernstein of Sweden, the Empress Catherine II and even the notorious Prince Potemkin but his experiences in Germany seem to have impressed him most strongly. There he was introduced to statistics as represented in particular by the writings of Baron Bielfeld and Zimmerman. "I find", he writes, "that in Germany they were engaged in a species of political inquiry, to which they had given the name of statistics".(2) Sinclair at once appreciated the potentialities of the new science but he differed from the Germans in the application which he envisaged for it. Their enquiries were principally directed towards obtaining a quantitative description of the political strength of a country. Zimmerman in his 'Political Survey of the Present State of Europe' concentrated on numerical data concerning the area of a

1. Annals of the Royal Statistical Society: 1834-1934. 1934. p.15.
2. Sinclair. History of the Origin and Progress of the Statistical Account of Scotland. 1798. p.v.

country, its population per square mile, the size of its land and naval forces, its income (from taxation) and expenditure, and occasionally its imports and exports. Sinclair on the other hand wanted to ascertain the state of society. - The original questionnaire which he sent in 1790 to the Scottish clergy comprehended the size and nature of the population, its age spread in terms of the respective occupations, social status, race and creed of their parishioners; the resources and output of each district, its acreage distinguishing waste, arable and pasture, the quantity of its vegetable products, the number and kind of its livestock, its manufactures and mineral deposits; the financial state of the inhabitants, the respective rent of land, houses, fishings, etc., the wages received by different kinds of workmen, the number of paupers and the sum contributed for their maintenance; and finally the state of the communications. To this list he later added queries about the number of schools, of taverns and new houses, distinguishing those which replaced demolished dwellings".(1) He equated statistical enquiries with the experimental investigations of the natural sciences. Their purpose was to provide detailed evidence from which natural laws could be formulated and the foundations laid of a science of government. Then it would be possible to promote by sure means "the happiness of individuals" and the "prosperity of states".(2) This interpretation of the purpose and value of

1. Sinclair. History of the Origin and Progress of the Statistical Account of Scotland. 1798 pp. xx - xxvii also 'Miscellaneous Essays'.1802. pp. 20,21.
2. Sinclair. A Code of Political Economy. 1821. p. ix.

statistics is given its fullest expression in the 'Code of Political Economy' and the 'Analysis of the General Account of Scotland' both published towards the end of his life but it is also contained in his earlier writings. For Sinclair the attraction of this science was always its application to social improvement.

> "To that science which points out the proper object of such enquiries and the surest means of making them effectual, the science consequently which tends to promote both the good of the individual and the prosperity of the State, which indeed includes in it every object of real utility connected with or arising from the existence of political society, I have ventured to give the name of political philosophy". (1)

The concept of a science of government is peculiarly associated with Bentham but it derived from the attempts of eighteenth century philosophers, both in England and on the continent, to formulate a rationale of human behaviour analogous to the interpretation of physical phenomena in terms of natural law. Happiness was generally assumed to be the ultimate goal and prime motive of human behavour. Difficulties arose as soon as this concept was related to the customary actions of men in society, i.e. to morality. Obviously individual happiness was various and individual action frequently directed to ends which were not immediately profitable.

Hutcheson, with whom the slogan 'the greatest happiness of the greatest number' seems to have originated, resolved this dilemma by inventing a moral sense which "reinforced and informed the benevolent

1. Sinclair. Essays on Miscellaneous Subjects. 1802. p. 311.

affections." In other words, he equated maximum happiness with the promotion of the public good. To Smith the idea of a moral sense whose existence, after so long a stretch of time, had only just been perceived was unacceptable. In its place he elaborated a theory of sympathies whereby the passions were so ordered by a beneficent Creator as naturally to promote the greatest good. This theory of a divinely ordered harmoney in human affairs likewise provided the basic principle of Smith's economic teaching. Even in the man-made world of business and commerce the unimpeded operation of an artificial market system must necessarily work for the good of the whole. Hume approached the problem of conflicting interests with greater realism. He argued that men adopted a mode of conduct not immediately profitable to themselves because of its social utility. Hence the principles of human behavour had no a priori basis but derived from men's reaction to circumstances. Therefore Hume maintained that it was possible to formulate from the results of observation laws of human behaviour analogous to those of physical phenomena. It was Bentham who attempted to apply these theories to actual government. He constructed an elaborate calculus of pain and pleasure in accordance with which legislation might be devised to make the happiness of the individual consonant with the happiness of society.

Sinclair was undoubtedly acquainted with these ideas. As a student he had attended Glasgow University where both Hutcheson

and Smith in turn held the chair of Moral Philosophy. But he used the terms associated with these ideas in a different way. When Sinclair spoke of a science of government he meant something in the nature of economic planning. In this he belongs to the tradition of the political arithmetician rather than the political philosopher. Sir William Petty also thought that numerical data about society would reveal regularities similar to the natural laws of physical science, and suggested the application of statistics to government in the shape of a general Registry of Lands, commodities and people. His primary concern was an increase in the national income which he chose to equate with an increase in population. — Sinclair too, it should be mentioned, identified national prosperity with a growing population. — An analysis of the size of the population, its consumption and productive capacity would make it possible for the manpower and resources of the nation to be most economically utilized.

> "And finally when we have a clear view of all persons and things, with their powers and families, we shall be able to methodize and regulate them to the best advantage of the public and of particular persons". (1)

Ideas of economic regulation had, of course, informed the Mercantilist system. By means of protective tariffs the legislature had sought to protect and promote specific industries of

1. Strauss (E) Sir William Petty. London. 1954. p.213.

national importance, among which agriculture occupied a prominent position. Sinclair, in common with other members of the landed interest, supported this policy. Throughout his life in 1791, 1804, 1815 and 1822 he actively associated with those who sought to make the corn laws more exclusive and more efficient. Equally with Lord Sheffield, the Earl of Hardwicke, and Charles Western, all of whom were at some time connected with the Board of Agriculture, he called for increases in the price level at which low duties came into force and resisted the warehousing of corn. But he also held views on the direct assistance which the State should give to economic enterprise, which were not those of his fellow author and collaborator as Secretary of the Board of Agriculture, Arthur Young.

In "The English Utilitarians" Leslie Stephen remarks that "Young was profoundly convinced that, as he says more than once, "everything in the world depends on government".(1) Such expressions were used by Young whenever the state of society provoked his censure. They do not appear to have any precise significance. So far as Young can be said to have subscribed to any consistent corpus of economic thought, he was an advocate of laissez faire. Lighter taxes and freer exportation, were the measures he recommended. Agriculture, he said, required only a negative encouragement. "Let it alone and it will thrive. You cannot hurt it unless you are active against it in taxation, corn-laws, etc.".(2)

1. Stephen (L.) The English Utilitarians. 1900. I. p. 73.
2. Young. 'Travels in France'. edit. Constantia. p. xxxv.
Maxwell

In contrast Sinclair advocated positive encouragement. The difference would seem to have been occasioned primarily by circumstances since both Sinclair and Young accepted as a fundamental principle that agricultural prosperity was 'the root of the tree that was the State'. But Young's ideas on economic policy which are contained for the most part in his 'Political Arithmetic' were formulated and published before shortages of grain had become recurrent, and when nothing but a free export seemed necessary to maintain the farmer's profits and so secure adequate production. By the time Sinclair, in the 1790's, turned his pen to agricultural and statistical labours, the need for an expansion in food production and the possibility of a threat to English Agriculture from foreign imports had arisen. Hence whilst Young could agree with the French Physiocrats and Adam Smith that the withdrawal of Government from the field of economic enterprize was desirable, Sinclair inevitably repudiated 'Laissez Faire'.

> "It is certainly better to let agriculture alone than to establish injudicious regulations respecting it. But if a government will make such enquiries as will enable it to judge of what may be done with safety and advantage; and will promote agricultural industry, not only by removing every obstacle to improvement, but by granting positive encouragement; agriculture will prosper with a rapidity and will be carried on to an extent which is hardly to be credited; and in a much superior degree than by the 'let alone system', under the torpor of which, ages might pass away without accomplishing what might be effected in the course of a few years, under a judicious system of encouraging regulations". (1)

1. Sinclair. 'Code of Agriculture' 1817. p. 476.

For Sinclair government was indeed all in a very positive way. Writing as he did at the end of the eighteenth and the beginning of the nineteenth centuries, he was naturally preoccupied with the social dislocation which resulted from an expanding population. Such dislocation and the accompanying unhappiness could, he was convinced, be prevented by informed legislation.

> "Hitherto in proportion as a country has increased in population, it has been found more difficult to govern it and to make the people happy. But why should that be the case? Why should not a great political society be always in a progressive state of improvement and why should not a legislature and the executive government endeavour to bring it, as far as circumstances will admit of, still nearer to perfection".(1)

If existing sources of employment were unable to absorb existing manpower, it was the duty of the government to promote public works like roads, ~~railways~~, canals and harbours, by loans at a moderate interest and with facilities in the repayment.(2) A similar suggestion was made by Bentham for the relief of unemployment.

> "The great evil manufactures are liable to is that of a temporary stagnation of trade, which leaves vast numbers at a time without employment and without subsistence. For a remedy I propose public works to be set on foot in the neighbourhood of manufacturing towns: to be carried out by none but manufacturers out of employment. For example, digging of canals, deepening of harbours, making of roads, building of fortifications".(3)

1. Sinclair. 'A Code of Political Economy' 1821. p.xiv.
2. ibid. p.34.
3. Bentham Works. x p.85. ed. Bowring.

public works were in any case regarded by the Utilitarians as within the sphere of State intervention since they were too large and unprofitable to attract individual enterprise.

Likewise, Sinclair maintained that if a man was unable by his own efforts to obtain an adequate subsistence, it was the duty of the State to provide for his maintenance.

> "Since it is the inferior classes by whom the soil is cultivated, - manufactures are carried on - and commerce is rendered productive, it is natural they should look for a maintenance in time of indigence and disease to those who have reaped the profits of their industry in the vigour of their days. Hence without going into the philosophical refinements of Grotius and Puffendorf, it may be fairly contended that man, in submitting to the restraints of civil society, does not resign the great right of self preservation, and that the State is entitled to require from persons possessed of property what may be necessary for the preservation of the lives of their indigent fellow subjects". (1)

He thus disassociated himself from those like Dr. Chalmers who advocated the abolition of a compulsory poor-rate but he believed in the principle of maximum deterrant. It should be the object of pauper management, he wrote, "not to help them (applicants for relief) on, but rather to help them off the roll of paupers".

But Sinclair's conception of the field of State intervention was not limited to the alleviation of distress. He advocated positive measures to prevent its incidence by promoting, if necessary artificially, such economic development as would support s growing population. These ideas

1. Sinclair. Analysis of the Statistical Account of Scotland. 1831. pt. II. pp. 148-149.

were undoubtedly influenced by his experience as a Highland landowner.

Sinclair's estates, grouped around Thurso, were situated in an area from which extensive emigration took place in the closing decades of the eighteenth century. The consolidation of farms and their conversion to sheep walk had undoubtedly occasioned depopulation, but Miss Adams, who considers this question in the Scottish Historical Review, maintains that this was not the main cause of the exodus. Primarily she attributes it to the fact that the population of the Highlands had outgrown its resources.(1) It was an area with very limited economic potentiality. The soil was poor and unsuited to intensive arable cultivation. "A small proportion alone of such country", wrote Sinclair, "can be fit for grain".(2) Communications were almost non-existant with more prosperous regions which were consequently too remote and inaccessible to stimulate agricultural improvement. Finally there were no industries to absorb the surplus population. In Caithness the only substantial alternative to the land as a means of livelihood was the herring fishery at Wick.

1. M. I. Adams. Scottish Hist. Rev. 1920. vol. xvii. p.85 'Highland Emigrations of 1783-1803'.

2. Sinclair. Essays on Miscellaneous Subjects. 1802. p.225.

Lack of employment was, therefore, the basic cause of the distress with which Sinclair was intimately acquainted. Agriculture could no longer serve as the economic framework of Highland society and certainly Sinclair did not regard it as such. Despite its depopulating effects, he continued to advocate the extension of sheep-farming as the most profitable mode of utilising the land, though on his own estates he made provision for displaced tenants. At Langwell he introduced a flock of five-hundred Cheviot ewes and planned to incorporate in his farm as sheepwalk, twenty-five thousand English acres, then occupied by eighty small farmers. "Humanity, however, required", he writes, "that above five-hundred individuals who inhabit the estate should not be driven from their ancient possessions without having some other means of subsistence pointed out to them".(1) This Sinclair did in the shape of two Scotch acres of arable land, a house and a garden plus the option of one hundred, two hundred or three hundred days' work for wages paid partly in money and partly in grain. Thus he sought to reconcile his notion of agricultural improvement in the Highlands with the maintenance of existing tenants.

But he had other suggestions for the economic development of Caithness. One or two of these bore fruit. It is recorded in

1. Sinclair. Essays. op.cit. pp. 227-228.

the Survey of this county that the construction of a harbour at Wick was initiated by Sinclair. He apparently persuaded the British Fisheries Society in 1803 to purchase the piece of land on the South side of the river Wick, which was soon afterwards recommended to the Government by Telford as a suitable site for a harbour. In addition to £1,000 already given to the above society for this purpose, £7,500 was granted from the balances of the forfeited estates fund. By 1815 the harbour was almost built.(1) Henderson also relates the eviction of a tannery, on Sinclair's recommendation, which became a profitable concern. His other projects, however, which included a mining company and a linen industry, never materialised.(2) The discovery at Skinnet of ore with a 70% lead content, of which about a cwt., was collected in a trial dig, could be adduced in support of a mining company (3) but no single favourable circumstance existed to justify the establishment of a linen industry. Flax was not a local crop; there was little demand for yarn and the high wages asked by weavers who were in short supply rendered the possibility of competing with Perth a remote one. Sinclair sought to demonstrate that these difficulties were temporary and with the support

1. Henderson (J.) General View of the Agriculture of Caithness. 1815. Appx. pp. 195-6.
2. Sinclair. Essays on Miscellaneous Subjects. 1802. pp.237-239. pp.241-242.
3. Henderson (J.) Op.cit. p.13.

of the local landowners and merchants could be removed, but his argument is unconvincing and unimportant. Essentially, he suggested these projects not as economic enterprizes but as answers to a social need. For Sinclair as for Young one of the functions of industry was to absorb surplus labour after the requirements of agriculture had been met. "As any political society increases in number", wrote Sinclair, "it is impossible even by means of agriculture and commerce to furnish sufficient occupation for the people unless a considerable proportion of them are employed in improving their own productions or those of other countries imported for that purpose".(1)

When Sinclair turned his attention from the local to the national scene his opinions were determined by the same basic principles. In the kingdom at large as in Caithness the growth of population was straining agricultural resources. The result was a periodic shortage of grain which in 1795 reached serious proportions and prompted the Malthusian Theory 'that population has a constant tendency to increase beyond the nourishment prepared for it, and that while the population proceeds in a geometrical, the means of subsistance only advances in an arithmetical series'. This Theory Sinclair unreservedly disclaimed. He chose to attribute the scarcities of the time to a deficiency in employment

1. Sinclair. Essays. op.cit. p.236.

rather than in the potentiality of the country to food production. By employment he presumably meant the utilization of the soil. If existing farm-land was more intensively cultivated, if new crops were introduced, if waste land was brought under the plough, the resources of agriculture would be found equal to the demands made upon them.(1) Sinclair regarded the promotion of such improvements as a responsibility of the Government and indicated the kind of policy it might adopt to this end.

First it was necessary to augment the farmers' knowledge. Several of Sinclair's suggestions fall into this category. One of them related to the dissemination of agricultural information.(2) The government was already assisting this object through the Board of Agriculture. Sinclair advocated its continuance on a more efficient footing.

Another suggestion was for the establishment of experimental farms "under the sanction and at the expense of government" to be open to public inspection and to publish regularly an account of each experiment.(3) It is interesting to note that Marshall included an experimental farm in his proposals for a Board of Agriculture.(4) The relevance of the scientific method to the

1. Sinclair. A Code of Political Economy. 1821. p. 30.
2. Sinclair. General Report of Scotland. 1814. III. pp.435-6.
3. Sinclair. Gen. Rept. ibid. p.437.
4. Marshall (W.) 'The Rural Economy of the Midland Counties'. Works V. 1790. pp. 124-5.

extension of agricultural knowledge was widely recognised by the end of the eighteenth century. In various parts of the country wealthy amateurs indulged in field experiments. But Sinclair thought accounts of individual investigations were 'too often rather the partial records of successful experiments than the faithful and impartial journals of success and disappointment'. Young, too, writing much earlier emphasized the need for repeated experiments and detailed observation before any fact could be ascertained with certainty.(1) Hence the advantage of a public experimental station.

Sinclair's remaining suggestions of this kind related to the founding of agricultural professorships, similar to that endowed by Sir William Pulteney at Edinburgh, and the establishment of veterinary colleges in all the principal towns of the kingdom.(2) The London Veterinary College was made the recipient of a Parliamentary grant of £1,500 on 10th May 1796, but it was probably given in recognition of the services it rendered to the cavalry. Certainly its attention was almost exclusively devoted to horses until 1839 when the newly established English Agricultural Society made it an annual grant of £200 for the provision of instruction in the pathology of sheep and cattle.(3)

1.Young. Essays on the state of the British Empire. 1772.
2.Sinclair. Gen. Rept. op.cit. p.439.
3.Watson (J.A.S.) 'The History of the Royal Agricultural Society' 1939. p.104.

Besides knowledge, the other indispensable conditon of greater agricultural productivity was a readily available supply of capital. Intensive cultivation and more particularly the reclamation of waste land involved heavy expenditure. Usually the country banks supplied the farmer of this period with the money needed for expensive undertakings like enclosure, deep drainage, or the construction of farm buildings. Manufacturers, however, through company flotation, had long possessed an additional means of drawing on the capital resources of the country. Sinclair wanted similar facilities to be made available to the farmer. He suggested the formation of public companies for the purpose of providing the landowner with loans at 6% interest. The sums so advanced should never be demandable but the stock of each company should be transferable like that of other public securities.(1)

The belief that the State should concern itself with the provision of credit facilities seems to have been entertained by Sinclair for many years. It was he who, in the commercial crisis of 1793 which was caused primarily by a shortage of specie suggested the offer of temporary loans in the form of exchequer bills.(2) In his later writings the suggestion of public loans recurs. During the agricultural distress which followed the peace he several times recommended such a measure to assist the farmer in a change-over from tillage to stock-breeding.(3)

1. Sinclair. Gen. Rept. op.cit. p.446.
2. Sinclair (Rev. J.) Memoirs of Sir J. Sinclair. 1837. I.pp.231-245.
3. Sinclair. Thoughts on the Agricultural and Financial state of the Country. 1815. p.13.

There was one other way in which Sinclair thought the Government could assist financially the development of agriculture and of economic enterprize generally. This was the maintenance of a paper circulation. At the time of the cessation of cash payments by the Bank, he deplored the substitution for coin of paper money, but in the years which followed he came to regard a note issue as the golden key to increasing economic activity and national wealth. The prosperity, particularly the agricultural prosperity which coincided with the introduction of a paper currency, but which arose out of war conditions, probably contributed to the formation of this opinion.

In explanation of these views, Sinclair maintained that "the wealth of a nation properly consists in the goods and merchandize it possesses, whether arising from the produce of the soil, - from internal industry, - or from foreigh commerce".(1) The precious metals were merely a species of merchandise whose increase or decrease could exercise no decisive influence on the country's wealth or prosperity. Money whether of paper or coin was only a vehicle of exchange but paper was preferable to coin because the amount in circulation could be more rapidly expanded. The extent of a paper circulation should, he said, be regulated by the quantity of labour which had to be paid for, the goods or merchandize which

1. Sinclair. Observations on the Report of the Bullion Committee. 1810. p.28.

which had to be transferred and the total amount of the demands and expenses of the Exchequer.(1) It was impossible to circulate notes beyond the immediate requirements of the public, since redundant money would automatically revert to the bank of issue.(2) To the charge that a depreciation in the currency, resultant on increases in the paper circulation occasioned high prices and distress, particularly for the rural labourer, Sinclair replied that an abundance of money was the condition of his regular employment.(3)

Hence in 1819, he opposed the resumption of cash payments. Of course, as a landlord, he contended that such a measure would aggravate agricultural distress, using arguments which by 1822 constituted the main line of attack followed by the landed interest in their struggle for relief and additional protection. He maintained that the consequent depreciation in the value of money would render it impossible for farmers to bear the weight of taxes imposed upon them. It would also result in the abandoning of marginal land which had been brought under the plough at heavy expense. But the positive ground of Sinclair's opposition to the Report of the Bullion Committee and the subsequent return to cash payments was his adherence to the cheap money policy as expounded by Thomas Attwood.

1. Sinclair. Observations. op.cit. p.36.
2. ibid. p.38.
3. ibid. p.39.

> "Mr. Attwood justly remarks that making money cheap necessarily makes property dear, and thus in an instant turns the current of the public fears and restores confidence and credit. This promotes production and consumption, and every thing else on which prosperity depends". (1)

It is in this context that Sinclair's concept of a Board of Agriculture can only be fully understood. Many of the ideas described in the foregoing pages are expressed in later writings but they are consonant with the purpose of the Board as he originally envisaged it. At the time of its establishment Sinclair had already begun to develop in his Scottish Report those statistical interests which equally with farming were to occupy his attention throughout his life. - Statistics, it should be mentioned, signified for Sinclair, the collection and codifying of information. — The notion of harnessing this pursuit to agricultural improvement seems to have occurred during the brief career of the British Wool Society. This society was formed in Edinburgh on January 21st 1791 at a meeting over which Sinclair presided. Lord Sheffield, the Earl of Hopetoun and Sir Joseph Banks, all Charter members of the Board, were associated with him in the enterprize. Its principal achievement was a short survey of the sheep-farming areas of North Britain, which established the suitability of Cheviot sheep for the production of both wool and mutton

1. Sinclair. On the Means of Arresting the Progress of National Calamity. 1817. p.13.

in hilly or mountainous regions. For the continuance of this work and for the improvement of agriculture generally, however, Sinclair declared that "the protection of the Government of the country and the superentendance of a Board of Agriculture properly constituted was essential.

> "To overcome the prejudices of all these difference descriptions of people and to give them new light and fresh information upon topics, which, they are apt to believe they must understand better than any other person is an operose and troublesome business which however important can never be effected without a degree of publicity and perseverance which can only be expected from a great national establishment constituted for that express purpose". (1)

A similar suggestion for a Board of Agriculture which should make local surveys the basis of better farming was made by Lord Kames in his "Gentleman Farmer".

But Sinclair did not intend his Board of Agriculture to carry out a purely agricultural survey. He intended it to include broader categories of information comprehended in the term 'statistical'.

> "The object of such a survey would be to ascertain the general state of the agriculture, manufactures and the commerce of the country, - the means of improvement of which they are respectively capable, the amount of the population of the State and the causes of its increase or decrease; the manner in which the territory of the country is possessed and cultivated; the nature and amount of the various productions of the soil; the value of the personal wealth or stock of the inhabitants; the diseases to which the people are subject, their causes and cure; the occupations of the people - : the condition of the poor, the best mode of maintaining them, and of giving them employment; the state of schools and other institutions

1. Sinclair. Address to the Public on the Improvement of British Wool. 1791 P.18.

> formed for purposes of public utility; the state of the villages, and of the towns in the kingdom and the regulations best calculated for their police and good government; and lastly, the state of the manners, morals and the general character of the people, and the articles in regard to which their situation is most capable of medioration and improvement".(1)

Correspondingly Sinclair did not intend the Board itself to be just an agricultural society concerned with technical improvement. Whatever affected agriculture was to come within its purview which should accordingly include wider economic issues. Its function should be not merely to instruct but to advise the legislature on those meausres which would promote the interests of agriculture, and, therefore, in Sinclair's opinion, the prosperity of the country generally.

> "By ascertaining the facts with minuteness and accuracy, the real state of the country must be made known and the means of its future improvement will be pointed out. Every field, it may be expected,will then be cultivated to the best advantage and every measure will then be taken that can best tend to promote the general interest of the Community"(2)

1. Sinclair. 'Plan for Establishing a Board of Agriculture' in Communications to the Board of Agriculture. I. Appendix B. p. xx.

2. ibid. p. xxi.

CHAPTER 3

THE ESTABLISHMENT OF THE BOARD: - ITS POWERS AND CONSTITUTION

Proceedings for the establishment of a Board of Agriculture were set in train with Sinclair's visit to London in December 1792. He came to seek Pitt's support for a publicly financed institution, to the sum, at first, of £10,500, which would undertake a statistical survey as a basis for the promotion of agricultural improvement. Eventually Pitt approved the proposal. - During the currency crisis of 1793 Sinclair had negotiated loans on the security of Exchequer Bills with Coutts and one or two other London Bankers and some favour was due to him.(1) - But his approval was given without enthusiasm. Before Sinclair rose to introduce his motion to the House, Pitt informed him that though he would not oppose the measure "his support would depend on what he judged was the sense and feeling of the House on that occasion".(2)

The motion for the establishment of a Board of Agriculture took the form of an Address to the Crown. This mode involved only one reading and could therefore pass more swiftly through the House. For this reason it may have been chosen. Sinclair introduced it in

1. Sinclair (Rev. J.) Memoirs of Sir John Sinclair. I. pp.231-245.
2. Communications to the Board of Agriculture. 1797. I. p.ix.

the Commons on May 15, 1793. Only thirty members were present. Consequently the debate was adjourned for two days. On the 17th the House numbered one hundred and twenty seven members. Sinclair had probably done some whipping up in the interval. But it is also possible that the cause of this considerable attendance was the debate on the addition of two commissioners to the Board of Control for India which took place the same day. In addition to Pitt, the motion was supported by Dundas, who possibly hoped to attach Sinclair to his Scottish contingent, Pulteney, Sir William Watkin-Lewes, Buxton, Duncombe, Rolle, Stanley and Scott who thought it "the duty of the House to protect agriculture as much as they had done commerce"(1) Such opposition as there was came from the Foxites. Most of it was factious, provoked probably by Pitt's support of the proposal. Despite the assurance given by Sinclair to the House that the members of the proposed Board would serve gratuitously, Fox denounced the scheme as a 'job' intended to increase patronage. "He disliked", he said, "an unnecessary increase in patronage and he did not know that His Majesty's ministers were the most capable of making a selection of those best qualified for Commissioners".(2) Sheridan and Gray voiced much the same opinion. A different objection was raised by William Hussey. Hussey was the member for New

1. Morning Chronicle. 18th May 1793.
2. The Star. 18th May, 1793.

Sarum and seemingly an opponent of the Landed Interest. In 1791, he opposed the exclusion of barley from the prohibition on exported grain; in 1796 he opposed the Waste Land Bill and in 1798 he suggested an equalisation of the Land Tax as a preliminary to its redemption, a measure abhorrent to improving landlords for obvious reasons. So also in 1793 he denounced the Board's establishment as a project for the improvement of the estates of great and opulent landowners at the public expense.(1) This was not however the most weighty ground on which he based his opposition. The establishment of such a board was, he said, unnecessary since a society for the same purpose, supported by voluntary contributions was already in existence in the Adelphi; - namely the Society of Arts. "He could not agree to taking £3,000 a year out of the pockets of people for the purpose of trying projects".(2) Presumably Hussey reasoned from the example of the Society of Arts, that an institution which could demonstrate its usefulness would not fail for want of public support. The Society of Arts originated in the suggestions of an obscure drawing-master discussed over coffee with a few public spirited and influential men, notably Lord Romney and Lord Folkstone. Membership was at once thrown open to anyone who could contribute at least two

1. The Star. op. cit.
2. The Morning Chronicle. 18 May. 1793.

guineas annually, and within a year £360 had been subscribed, rising to £632 for the following year.[1] But Shipley's plan was better adapted to win widespread public interest than Sinclair's. From the very beginning he offered premiums or prizes for specific and limited objects within the capacity of an individual, a policy to which the Society continued to devote all its energies. Sinclair, on the other hand, intended his Board to collect information which would assist improvement on a large scale rather than to stimulate individual effort. Hence his determination to obtain for it a public establishment. His plan contained no reference to premiums which during the first seven years of the Board's existence find no place in its programme. Its ordinary or participating membership, moreover, was limited to thirty. Apart from its Parliamentary Grant and the official membership these are the principal differences between the Board and the Society of Arts.

It is interesting as an illustration of the lack of any exact notion about the nature and function of the Board that it should have been opposed both as an unsuitable extension of administration and as an unnecessary and expensive addition to the existing agricultural societies. In reply, Pitt assured the House that the

1. Hudson and Luckhurst. The Royal Society of Arts. 1754-1954. p.11.

Board would not provide any additional patronage since the only salaried positions were those of the secretaries and clerks. Nor would it be permitted to expend public money in premiums on the prosecution of projects. The funds placed at its disposal would be very limited. He therefore cautiously recommended its establishment for five years at an income of £3,000 per annum as an 'establishment likely to do much good'.(1) As an experiment for a limited time rather than an administrative innovation it was more defensible. The address passed the Commons with one hundred and one members voting for it and twenty-six against.(2)

Accordingly about three months later on 23rd August 1793 Lord Loughborough set the Great Seal on Letters Patent and brought the Board of Agriculture into being. But although a Board by name, it was not a Board by nature. "The address of the Commons", wrote Sir John Scott to Sinclair, "has proceeded upon the idea that His Majesty could give some legal character to a Board as a Board though not constituted to do the office of some great state officer whose office is vacant, or to execute some duty incident to the character of the King to execute as such. We do not immediately perceive what duty of His Majesty he can delegate to a Board of Agriculture".(3) The Board of Agriculture never received a com-

1. The Star. 18th May, 1793.
2. ibid.
3. Rev. John Sinclair. Memoirs of Sir John Sinclair. 1837. II. p. 53.

mission from the Crown. For this reason it cannot be compared with the old Board of Trade. Although its duties were primarily advisory this latter institution conducted the King's business in negotiations with foreign powers for the safety of merchants. No analogous functions existed which could be performed by the Board of Agriculture.

In one respect only it possessed a link with the administration. Several important ministers of state were included in its constitution as ex-officio members. They were the First Lord of the Treasury, the Secretaries of State, the Lord Chancellor, the Lord Privy Seal, the Lord Advocate of Scotland, the First Lord of theAdmiralty and the Master General of the Ordnance. Two minor officials, the Surveyor General of Crown Lands and of Woods and Forests were also attached to the Board in this capacity, presumably because their duties bore some correspondance to its field of activity. Later by a Board resolution of June 13th 1795, ex-officio membership was conferred on the President and the Vice-President of theBoard of Trade, Lord Hawkesbury consenting, "I shall be ready to attend the Board of Agriculture", he assured Sinclair, "whenever my other occupations will afford me sufficient leisure".(1) To complete the list certain other important institutions were represented in the persons of the Archbishops of Canterbury and York, the Bishops of London and Durham, the Speaker, the Lord Mayor of London and the President of the Royal Society.(2)

1. B.M. Add. Ms. 38, 310 f138. Hawkesbury to Sinclair. 13 June 1795.
2. Communications. op.cit. Appendix D. Charter of the Board.

Of this goodly company only the President of the Royal Society, Sir Joseph Banks, and the Surveyor General of Crown Lands, George Fordyce, attended with any regularity. — Sir Joseph Banks was personally interested in agriculture. His botanical interests are well known but the improvement of fine wooled breeds may be mentioned as another of the diverse objects to which he devoted his attention. Several letters exist written to him by Sinclair on this subject. In 1786 he was among those who opposed the Wool Bill. - None-the-less the ex-officio members were not just a frill. They were intended to exercise some control over Board proceedings. This was illustrated in 1798 when they attended the annual meeting to prevent by their votes the re-election of Sinclair as President.(1) He had contrived during five years in office to saddle the Board with a load of debt. Presumably this accounts for the action of the ex-officio members. Their purpose was to ensure the provident expenditure of public money. Similar groups were included in the constitution of other bodies unconnected with government but financed from the public purse like the British Museum and the Board of Longitude. They usually numbered one or more officials whose work was closely related to that of the subsidised institution. The Master of the Rolls is automatically a member of the governing body of the British Museum.

1. Board Mss. Rough Minute Book. 1797-'99. March 27th 1798.

Surprisingly the Royal Dublin Society had no specified ex-officio membership. Like the Board of Agriculture it was a publicly financed Society to the sum of £10,000 per annum "for promoting husbandry and other useful arts" in Ireland. It is probable however the several of its charter members who occupied important positions in Church and State were official nominations. They included the Lord Lieutenant, the Earl of Harrington; the Archbishops of Armagh and Dublin; the Chancellor of Ireland, Lord Newport and the Chancellor of the Exchequer, Henry Boyle.(1) Sinclair makes no reference to the Dublin Society in support of his claim for a Board of Agriculture, but he doubtless knew of it. Young certainly did. In his autobiography he complains that this society though founded for the encouragement of agriculture was devoting too much of the money entrusted to it by Parliament to the promotion of manufactures. Among contemporary institutions these provide the closest parallel to the Board of Agriculture.

In all other respects it was like a private society. Its legal character was that of a corporate body consisting of a President, Secretary, Treasurer and thirty Ordinary members. - Ordinary members were full members possessing the right to vote. Other interested persons were attached as honorary or corresponding members. - Its membership was elective. These elections took place at the General Meeting which was held on the 25th of March. At this meeting the

1. Royal Charter of the Dublin Society. Dublin (1814?).

President, Secretary and Treasurer were annually elected. Five Ordinary members were also changed. Those asked to vacate their place were selected on the principle of least attendance during the year which had just passed. Illness was regarded as an extenuating circumstance as with Wilberforce whose request that he might retain his membership for a further year was conceded.

The original members were, of course, nominated in the Charter. It is difficult to determine on what principle they were selected. Certainly, it was not political. Membership of theBoard since it carried with it no emoluments was in any case unsuited for patronage purposes, and Sinclair, not Pitt, was responsible for drawing up the list. Hence among the Board's nominees supporters of both parties are to be found; Whigs, like the Duke of Bedford and Coke of Norfolk and Ministerialists like Wyndham, Lord FitzWilliam and Robert Smith, who later became Lord Carrington. Setting aside, therefore, political considerations the most obvious qualifications for such a Board was an interest in agricultural improvement. Most of the members possessed it. Frances, fifth Duke of Bedford, and Thomas William Coke, first Earl of Leicester, had already won a prominent position in farming society by their annual agricultural meetings or shearings. George O'Brien Wyndham, third Earl of Egremont, was a president of the Sussex Agricultural Society. Like the Earl of Winchelsea, another Charter member, he had also experimented with cottage gardens or allotments as a preventative of rural distress. Thomas Thynne, Marquis of Bath had paid sufficient

attention to sheep-breeding to secure a premium of the Bath Society, and John Southey, Lord Somerville, who also belonged to this Society, was regarded as an authority on stock. Richard Watson, Bishop of Llandaff, had turned his energies to land-reclamation in Westmorland. The Duke of Grafton, though not a noted enthusiast, was a friend of Arthur Young and presumably interested in agriculture. His estates were situated in Whittlewood Forest, Northamptonshire, and his country seat was Wakefield Lodge. He apparently took an interest in agricultural improvement. In one of his 'Tours' Young records a successful experiment by the Duke to clear a meadow of ant-hills by rolling, rather than cutting.(1) He also remarks on the perfection of the white-thorn hedges which surrounded the Duke's farm.(2) The Duke of Buccleuch was president of the Highland Society. Lord Sheffield and the Earl of Hopetoun had both been associated with Sinclair in the British Wool Society. Of the untitled members of the Board, Christopher Willougby and William Geary appear to have been considerable landowners in their respective counties of Oxford and Kent.[3] Agricultural interests, therefore, appear to have governed the initial composition of the Board. - Only a few members, the Earl of Lonsdale, Earl Moira, Lord Clive, Windham and Pulteney cannot be accounted for in this way. - But the diverse localities to which these members belonged also suggest that Sinclair may have

1. Young. 'Tours in England and Wales'. L.S.E. Reprints of Scarce Tracts, no. 14. 1932. p.213.
2. ibid. p. 218.
3. For these biographical details; See Appendix 2.

thought it would facilitate his intended inquiries to secure for the Board contacts over a wide area of Great Britain. Southern Scotland, Yorkshire, Cumberland and Westmorland, Norfolk, the Midland Counties of Leicestershire and Bedfordshire, Essex, Kent and Sussex in the South and Rutland, Shropshire and Somerset in the West were all covered in the person of one or more members.

Sinclair, as founder of the Board, became, of course, its first President and Arthur Young was nominated in the Charter as its Secretary, a post to which he was annually re-elected until his death in 1820. It was an obvious choice. By 1793, Young, through his pen, had established himself as an authority on agriculture. As a farmer he had consistently failed. "You are as great a quack in farming as I once was in politics", the Earl of Bristol wrote to him,(1) But as a writer he was more prolific and more influential than any other. His publications included not only small works like the Farmers letters, but the three great 'Tours' of the Southern, Northern and Eastern counties, of which he claimed his 'Six Months Tour', presumably of the Northern counties, first laid before the public the principles of Norfolk husbandry.(2) He had also begun to edit the Annals of Agriculture. The reputation thus gained had already secured for him in 1785 honorary membership of the Royal Society of Agriculture of Paris and in 1786 of the Patriotic Society of Milan and the Geographical Society of Paris. He was also a member of the Society of Arts. On the establishment of the Board he

1. Young. Autobiography. ed. Betham Edwards. 1898. p.228.
2. ibid. p.44.

therefore expected to be offered the Secretaryship. When Sinclair acquainted him with his plans, Young replied, "Your Board of Agriculture will be in the moon. If on earth, remember I am to be Secretary".

There was, however, one other potential candidate for the post, William Marshall. Like Young, Marshall was interested in recording agricultural practice in different parts of the country but his approach was more scientific. Young's 'Tours' were compiled from observations made during a fairly rapid progress through a large tract of country and therefore present an impressionistic picture. Marshall's surveys were based on observations made over a much longer period as a resident in the district concerned. Consequently, though they present a more selective and critical account of farming in different areas, they took longer to compose. In 1793 the Rural Economy of Yorkshire, and of the Midland Counties only had been published, and Marshall's fame did not equal that of Young. Nonetheless in the Spring of 1793 Sinclair consulted him about the Board, possibly because a similar proposal was made in the Rural Economy of the Midland Counties, and Marshall was sufficiently expectant to feel pique when it was set up and the President and Secretary appointed during his absence from London. Hence he chose to describe the Board's establishment as a 'job' to avoid the importunities and quiet the still more ambitious cravings of the President, or to embrace a fair opportunity of rewarding a recent change of political sentiments in the

Secretary".(1)

Marshall's suggestions were not without substance. Certainly Sinclair was eager for office. In 1794, he informed Pitt of his desire to be placed at the head of a Board for the administration of Crown lands, then under consideration, and in 1800 asked the Earl of Bathurst to procure for him a seat on the Board of Trade.(2) Both requests were refused. In his account of the establishment of the Board, Sinclair himself considered it necessary to refute the latter charge. "Young", he said, "applied for the office in question", should the plan succeed, "not to the Minister but to a private friend, on whom the nomination of Secretary to his own Board would necessarily devolve. No member of the administration indeed interfered inthe nomination of anyone of the officers".(3) This statement was not entirely true. The appointment of the Secretary may have lain solely with Sinclair but Young certainly approached Pitt. "It is impossible", he wrote, "I should know what is your intention in relation to the office of Secretary, but the same wisdom which established the Board will, without doubt give such an appointment to that office as may fill it in a manner the best adapted to the business".(4) In reply, George Rose assured him that Pitt approved his appointment.

1. Marshall. A Review of the Agricultural Reports. North of England. York 1808. p.xxiii.
2. Correspondence of Sir John Sinclair. 1831. I. p.137.
3. Communications to the Board of Agriculture. I. p.viii.
4. Young. op.cit. pp. 220-221.

So long as Sinclair filled the office of President, Young's influence over the direction of Board affairs, however, seems to have been negligible. Young complains that Sinclair directed all communications to be sent to him and insisted on signing all letters. "This", he writes, "at once converted the Secretary into nothing more than a first clerk".(1) It must have been particulary irritating since Young knew more about practical farming than Sinclair. Likewise in material provisions, little consideration was given to his status. He was required to share a room for transacting Board business with the Under-secretary and two clerks. It is not, therefore, surprising he rejoiced when Sinclair was turned out of the Presidency, and the Board procured a house of its own.(2)

Of the total membership of the Board, only a small proportion was present at any one meeting. In so far as the autocratic conduct of its first president allowed, its activities were, therefore, determined by the few who attended most often. Unfortunately the records for the first four years are no longer complete but minute books of the finance committee and a number of miscellaneous committees held during the scarcity years of 1794-'96 still survive. It is possible from these to make some deductions about the attendance of the Charter members. Most of them, with the exception of the Earl of Moira, Lord Lonsdale and Windham, were present at one or two meetings.

1. Young. op.cit. p. 241.
2. ibid. p. 220.

Only a few attended frequently, namely Christopher Willoughby, George Sumner, the Duke of Bedford, Lord Somerville, Sir Joseph Banks and the Bishop of Llandaff, the Surveyor General of Crown Lands, Sinclair as President, and Arthur Young as Secretary. Of the above members, Sinclair, Lord Carrington and George Sumner had seats in the House of Commons.

The meetings of the Board took place weekly on Tuesdays during periods corresponding to the Parliamentary sessions. It became the practice at these meetings merely to refer matters to the consideration of the committee of the Board and to confirm their decisions. This committee also met weekly, on Fridays. Any member could attend. At first it was called the Committee on Papers and Expenditure but the title was modified to that of the General Committee which more aptly describes its functions. It facilitated the dispatch of business by withdrawing from the Board meeting every issue which called for discussion and supplying it instead with recommendations which could rapidly be made the subject of formal resolutions.

In September 1793 in a house in Sackville Street the first of these meetings was held and addressed by Sir John Sinclair as President. It was reported as follows in the issue of September 10th, 1793 of Lloyds Evening Post:

"The Board of Agriculture lately appointed by authority of Parliament have begun their operations by directing a survey to be taken of the several counties of Great Britain in order to ascertain the excellencies and defects of the husbandry practised in each, so as to enable them to make a report in the ensuing Winter of the present state of husbandry throughout the kingdom and what improvement can be made therein".

CHAPTER 4

SINCLAIR'S FIRST PRESIDENCY

Once the Board had been established Sinclair lost no time in proceeding to implement his plans. The size of the annual grant undoubtedly disappointed him. Instead of £2,500 he had hoped for £10,500. "The enclosed plan is on a lower scale than I could have wished"[1] he wrote to Young. Likewise he failed to obtain from the Treasury the right of franking or permission to solicit the co-operation of the Anglican clergy in his statistical enquiries. These circumstances compelled the substitution of agricultural reports for the statistical survey. But he did not abandon his original intention of using the results of these inquiries to secure with all speed legislation for the encouragement of agriculture. He hoped, he informed the Board in his inaugural address, that "the first report on the general state of the husbandry of the country might be ready in order to enable Parliament to take some effectual measures for the benefit of agriculture in the course even of the ensuing session".[2] This was the spur which drove him to appoint the county surveyors before ever the Board had met and to press for the completion of the reports by 1794.

Young's complaint that men were employed to survey counties "who scarcely knew the right end of a plough" was not however al-

1. B. M. Add. Ms. 35, 127. f248. Sine to Young. no date.
2. Communications to the Board of Agriculture I p.xxxii.

together justified.[1] The majority of those chosen had some connection with the land. Many were estate agents or land surveyors. Thomas Stone was employed by the Duke of Bedford, Thomas Davis by the Marquis of Bath, and Bailey by the Earl of Tankerville. Nathaniel Kent, John Claridge, Joseph Grainger, Isaac Leatham, Peter Foot and John Middleton also belonged to this profession. A few, such as John Billingsley, John Boys, George Turner and George Culley, were farmers. William James and Jacob Malcolm were nurserymen.[2] Even of those about whom Marshall knew nothing, several impressed his critical mind as men with an intelligent grasp of agricultural matters. Thus, he describes Walker, the author of the Hertfordshire report as "a professional man of superior intelligence in many particulars relating to rural concerns".[3]

Nor were the early reports uniformly worthless. Marshall commented on Stone's 'Lincolnshire' that his performance does credit to his profession",[4] and on Maxwell's, 'Huntingdonshire' that "seeing the extensive knowledge which he evidently possessed, and the judicious manner in which the sketch he has given of it is written, ... it is much to be regretted that he should not have, afterwards, been prevailed upon, by the Board, to have revised and completed it for publication".[5] He likewise approved of Davis' "Wiltshire", Vancouver's "Cambridgeshire" and Young's "Suffolk".

1. Young. Autobiography. edit. M. Betham Edwards. 1898.
2. Marshall. Review and Abstract of the Reports of the Board of Agriculture. York. 1818.
3. ibid. V. p. 5.
4. Marshall. A Review of the County Reports. 1808. Eastern Department. p.14.
5. ibid. p.211.

"In this Report we find the Secretary of the Board ..... is rarely employed in piling up the unsupported assertions of those with whom he happened to converse".(1) But owing to the haste with which they were compiled most of them were too slight. For this Sinclair must be held responsible. Though, in extenuation of his rashness, it should be remembered that he intended them only as drafts to circulate among farmers for comment. Hence the wide margins of the first series. Had this plan been carried out, the results would, thought Marshall, have been valuable.(2)

The urgency with which Sinclair wished to direct the attention of the Legislature to the needs of agriculture was not peculiar to him. It corresponds with the dissatisfaction which some members of the Agricultural Interest seem to have felt about the conditon of farming at that time. Undoubtedly the opinion of the Lords' Committee of Privy Council that home production could no longer supply the nation's grain requirements gave them a shock.

> "That agriculture does not flourish here as it does in a free country is self evident from one great fact for which we have the highest authority, viz. that we do not possess enough to feed ourselves".(3)

Young, convinced that the country's agricultural resources were far from fully developed, could attribute this to one cause only. Agriculture was not sufficiently profitable to attract the necessary capital.

1. Marshall. A Review of the County Reports. Eastern Dept. 1808. p. 405.
2. ibid. Northern Department. p.xxvii.
3. Young. Annals of Agriculture. XVI. 1791. p.110.

> "This is not an age for retaining men in a country because their grandmothers were born in it"; he wrote in 1791, "and if double the interest will arise from land in France to that which accrues from it in England, capitals will unquestionably be invested there".(1)

Sheffield too remarked in 1791 with reference to the new corn bill that there was "no danger of the corn bounty deflecting too much capital to agriculture from which we have turned too much of our capital",(2) and Sinclair, in 1798, opposed the redemption of the land tax chiefly on the ground that it would rob the industry of essential capital. The money used for this purpose might otherwise have been employed to improve the land and secure an increase in yield.

Such statements set against the general picture of the development of agriculture in the eighteenth century are somewhat surprising. It was an age during which the rate of Parliamentary enclosure accelerated, and reached a peak in the closing years of the century. Enclosure could not be carried through without heavy capital expenditure. - The Board in 1808 estimated the cost of an average enclosure of 1612 acres at £1650. 7. 6., app. £1 per acre.(3)

- Thus Rostow cites the enclosing activity of the late eighteenth century as an instance of the enterprise resulting from the easy credit facilities which preceded the outbreak of the French War. There

1. Young. op.cit.
2. Sheffield. Observations on The Corn Bill now depending in Parliament 1791 p. 28.
3. Board of Agriculture. General Report on Enclosures. 1808.

does not seem, therefore, to have been any marked check in agricultural investment. But Young and Sheffield were probably referring less to the expense of creating the enclosed farm than that of drawing from it higher yields by costly improvements like drainage and the preparation of the soil with the appropriate manures. According to contemporary agricultural writers, particularly Thomas Stone, tenants who had competed for the possession of a farm frequently found themselves unable to make a profit large enough to cover the expenses of rent and taxes and leave a margin for reinvestment in the land. In the annals of 1788 William Macro expressed a similar opinion:

> "As a well wisher to all improvements to agriculture, I am sorry to find that it is now quite out of fashion for the proprietors of lands to bear any part of the great expense that attends claying and marling, and which on that account falls cruelly heavy indeed upon the common farmer that has a taste and spirit for improvement and who too after spending a sum of money nearly equal to the value of the lands he improves lies under a certainty, I may say, of not enjoying the benefit of them for little more than fifteen years without the ungrateful return for all his labour and industry that of being obliged to pay an advanced rent for his own improvements ..... If the full scope and extent of this circumstance is united not only with the superior keenness of the clergy in bargaining for their tithes, but also with the enormous rise of poor rates, I do not conceive that any reference whatever to the fortunes made in former times can be fairly allowed to be in the least degree applicable to the state of agriculture at present".(1)

Likewise, Abraham Wilkinson wrote in 1794:

> "The advance of rent and taxes obliges the Middlesex farmers to make the most of their land by a quick succession of crops. Turnip seed is sometimes sown on the wheat stubble ploughed up immediately after harvest".(2)

1. Macro (Wm.) Annals IX. 1788. pp. 118 and 129.
2. Wilkinson (A.) Annals XXII. p.57.

To these statements one more may be added which supports the impression that the farmers' unproductive expenses had increased to such an extent in the years immediately preceding the French Wars as to constitute a check to improvement; that, in short, agriculture was not considered at that time a profitable form of investment. It was made by J. H. Campbell, a contributor to the Annals in 1791. In an article describing a journey from Buxton to Manchester, Liverpool and the mouth of the Ribble, he remarks that "while manufactures have advanced in the time and still go on with a rapidity hardly to be overtaken for comparative calculation, agriculture had been in a state of stagnation or, one would be tempted to think, must have been retrograde".(1) The contrast between the rapid increase in the productive powers of industry and the sporadic and piecemeal improvement of farming must have been particulary marked in this part of Lancashire since the factory system was most advanced in the cotton manufacture. Elsewhere, in the woolen industry of Yorkshire and the metal industries of Birmingham, a geat deal of small scale production still survived. None-the-less, Young too in 1792 compared the state of agriculture unfavourably with that of manufactures. He chose to attribute it, probably for reasons of policy, to the only factor which did not call in question the productive potentialities of the soil or the conduct of landowners, namely the unequal burden of taxation borne by land.

1. Campbell (J.H.) Annals. XV. p.563.

> "When this gentleman speaks of rapid advances in wealth and prosperity, I hope he does not mean in agriculture; he certainly alludes to other branches of industry for in husbandry the advances have been incredibly slow and painful compared with progress in every other part. And why have they been so? Clearly owing to the weight of taxes and especially to that of tithes". (1)

In fact the real reason for the spectacular increase in the returns of industry compared with those of agriculture was inherent in the respective nature and conditon of each. The subdivision of labour and the substitution of mechanical for manual processes could never be introduced into agriculture to the same extent as manufactures. Moreover, since the best land had long been under the plough, the productive resources of farming could only be increased by more intensive cultivation or the use of less fertile soils. The invariable result was increasing costs and diminishing returns. Ricardo used this fact to support his contention that every increase in agricultural productivity enriched the landlord and farmer at the expense of the consumer since prices were determined by the cost of cultivation on the poorest land. He chose to incorporate this thesis in a theory of differential rent. Ricardo defined rent as "that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil". (2) It began to be paid when the demand for land of the highest fertility outstripped its supply.

1. Young. Annals. XVI. p.282.

2. Ricardo. Principles of Political Economy. 1817. p.49.

As the pressure of population forced into cultivation land of a successively inferior quality, the rent of better land proportionately increased in an ascending scale. Hence rent was "the difference between two equal quantities of capital and labour".(1) The most questionable part of this theory is Ricardo's assumption that price would equal cost. In practice the price of foodstuffs would only be so determined as long as population continued to press on agricultural resources. The Malthusian principle that population increases with every increase in the means of subsistence is a necessary postulate of Ricardo's theory of rent. During the French Wars this condition to some extent existed and possibly provided the subject matter of Ricardo's rationalisations. But the agricultural depressions of 1816-17 and 1820-22 which resulted from abundant harvests demonstrated the fallacy of the contention that marginal cultivation would necessarily raise prices and correspondingly enrich the landowner and farmer.

Young's assertion that agricultural profits were unduly burdened with taxation became a common complaint among the landed interest, particularly as the struggle for corn protection developed. It was not without substance. Agriculture paid more in taxes than did manufacturing industry. They were of three main kinds; a land tax paid to the central government, parish rates and a tithe

1. Ricardo. op.cit. p.57.

for the upkeep of the Church. Before Pitt's Income Tax land was practically the only form of income directly taxed. Assessments were made on the salaries of some civil servants but the amount was frequently refunded with the permission of the Treasury by the Department concerned.(1) Otherwise the original intention of taxing personal estate as well as landed property had completely lapsed and the taxation of income was attempted only indirectly by means of sumptuary taxes and inhabited house duties. The Poor Rate although it was a general levy probably fell heaviest on the farmer. England was still a predominantly rural country, land was the easiest form of property to tax effectively and in some measure the Law of Settlement obliged the country parishes to support the urban poor. Tithe was peculiar to agriculture. But none of these taxes were new. The most recentof the, the LandTax, had been imposed since 1692. They were all, therefore, in existence in 1774 when Young remarked that, "The public revenue of Britain is raised by such a mode of taxation that little of the weight falls on husbandry".(2) Young was here referring to the assessment method used in the Land Tax instead of a proportionate levy on rental. Since no change had been made in the assessment since the tax was instituted, it bore no relation, inthe late eighteenth century, to the real value of landed

1. Ward (W.R.) The English Land Tax in the 18th Century. 1953. p. 27.

2. Young. Political Arithmetic. 1774. p.6.

property, and therefore, said Young, did not operate as a deterrent to improvement.

The change in Young's opinion between 1774 and 1792 cannot be accounted for by any alteration in the form of the land tax. Although the amount was raised from 3 to 4/- in 1776, it continued to be collected in accordance with the old assessment. Nor were any new taxes imposed until Pitt began to reorganise the national system towards the end of the century. In 1797, as part of the assessed taxes he doubled that on horses used in agriculture, and in 1799 he included both the rent and the produce of land in his Income Tax proposals. Both measures were opposed by Sinclair. Before this date, any increase in the financial burdens borne by land must, therefore, have been produced by heavier poor rates or tithe.

Of a rise in the Poor Rate, there could be no doubt. It aroused sufficient concern to be the subject of a parliamentary enquiry. In 1776 a Select Committee on the state of the Poor requested the overseers to make returns of the parochial expenditure on the maintenance of the poor. According to the Rev. William Butts, poor rates had increased in his parish of Glemsford from £678. 5. $8\frac{1}{2}$ to £1,062. 6. $4\frac{1}{2}$ between 1772 and 1790.(1) The farmers' costs inevitably rose. William Macro enumerated the enormous rise in poor rates as one of the factors which tended to make farming unprofitable, and the Rev. Joseph Townshend, writing in 1787, considered they discouraged agricultural improvement and prevented

1. Rev. Wm. Butts. Annals. vol. XVII. p. 497.

waste cultivation.[1]

For some time before the scarcities in the closing decade of the century, the cause of this increase eluded contemporary observers. One or two writers, among them Sir William Young, chose to attribute it to depopulation produced by grasping landlords who consolidated farms and enclosed waste. Ruggles refuted this assertion by pointing out that the increase in the poor rate had been general throughout the country and that the creation of large farms usually provided employment for those who had been deprived of their livelihood.[2] Modern research tends to confirm the fact that the dispossession of the small farmer was occasioned less by the enclosures of the eighteenth century than the agricultural depressions which followed the conclusion of the Napoleonic War. More frequently the increase in the Poor Rate was attributed to the profligacy of the poor who wasted their substance in riotous living. Tea drinking and ale houses Young considered the cause of their distress, and the Poor Rate "attacks on thrift for the maintenance of the drunken, the idle and debauched".[3] The remedy was obvious. The poor should be encouraged to make provision for their future needs. Hence Young in anticipation of the policy of the "maximum deterrent" advocated, in 1774, the abolition of outdoor relief and the mainten-

1. Annals. XVIII. p.608.
2. Ruggles. History of the Poor. printed in Annals. XIX. 1793. pp. 173-175.
3. Young. Farmers Letters. p. 296.

ance of the deserving poor in Houses of Industry.(1) Many of the early agricultural societies sought more positively to encourage providence. They included in their premium lists of awards for labourers bringing up the largest number of children without parish relief. Other premiums were intended to encourage the establishment of Friendly Societies. These societies continued to be considered one of the most efficacious means of inducing the poor to make provision for their misfortunes. Sinclair thought them worthy objects of public encouragement, and in 1799 referred to Pitt proposals for a new institution called a Board of Insurance which would supervise the establishment of such societies and be enabled by Government assistance to pay 5% instead of 3% interest. The plan was preserved but not implemented.(2)

But, although most contemporaries seem to have believed that the poor could if they would provide for themselves and must be encouraged to do so, at least two writers differed from this view. Howlett and Nathaniel Kent maintained that poor rates had risen because the price of provisions had outstripped the advance in wages and the labourer was no longer able to afford an adequate subsistence.(3) The investigations of Sir Frederick Eden, and more particularly of David Davies into the situation of labourers in husbandry which were

1. Young. op.cit.
2. Pitt Papers. Public Relations Office. vol. 178. Sinclair to Pitt. 24 April 1799.
3. Howlett. The insufficiency of the causes to which the increase of the poor rates have been commonly ascribed. London. 1788. p.56 & 68-9.
   Kent. Hints to Gentlemen of Landed Property, 1776. p.273.

published in 1795 confirmed this opinion, whose truth was in any case only too clearly demonstrated during the scarcity of that year. Young was converted. With reference to Whitbread's bill, which proposed that J.Ps. should be empowered to fix minimum wage rates, he remarked that the prices of husbandry labour were much too low.

> "This object is within the power of law and regulation, and though there are principles that would be hurt by interfering, yet the nature of the call is too pressing to be neglected".(1)

A considerable number of those who answered the queries printed in the Annals concerning the desirability of regulating minimum wages in accordance with the price of wheat concurred in this opinion.(2) Whitbread himself during the debate on his bill stated in correction of a remark by Sir Charles Bunbury that "in many parts of the Kingdom the farmers did not deserve any blame, as they had voluntarily increased their labourers' wages, although they were unable, consistent with their own necessary profits from the cultivation of their farms, to raise them proportionate to the price of corn".(3) The Landed Interest were far from wholly unsympathetic to the privations the the labourer. Speenhamland was an attempt, despite the rejection of Whitbread's minimum wage proposals, to secure to the labourer a sum adequate to his subsistence. Unfortunately, it was most mis-

1. Young. Annals. XXV. p.470.
2. Annals. vol. XXV.
3. Parliamentary Register, 1795. XLIII. p.348.

guided, for it deprived the labourer of the advantages he might have obtained from the free operation of the market. The country gentry responsible for its introduction were, says Polanyi, ignorant of the true nature of the Industrial Revolution and market forces. By 1817, however, Sinclair at least recognised quite clearly the errors of the system. "It was", he said, " a most exceptionable mode of making up the deficiency (i.e. between wages and the price of provisions), for labour would otherwise have found its own level".(1)

In these circumstances, with opinion so divided, it was not to be expected that the Board of Agriculture would make any substantial contribution towards the solution of the poor relief problem. David Davies had dedicated his book to the Board in the expectation that it would undertake enquiries into the state of the labourer in husbandry. "If the result should be that the pay of the day labourer is not adequate to his necessities; then on their representation of the matter a rational plan may be devised for his speedy relief".(2) The hope was illusory. Even in 1795 it was optimistic, and after the failure of the General Enclosure Bill, impossible. Although of importance to the farmer, the poor law problem affected every section of the community and was quite beyond the scope of a humble institution like the Board of Agriculture.

1. Sinclair. Code of Agriculture. 1817. p.82.

2. Davies. Case of Labourers in Husbandry, 1795. p. 1.

With tithe it was otherwise. It was a charge peculiar to agriculture, for it had originated at a time when land was the major, if not the only, source of wealth. Clarke traced the legal appropriation of tithes to the year 960 during the reign of King Edgar.(1) They were of three kinds. Praedial, or great tithes, were drawn from crops or timber; the immediate produce of the soil. These belonged to the rector. Small or mixed tithes were imposed on poultry and livestock. These belonged to the vicar. Theoretically personal earnings were also titheable, but the clergy rarely exercised this right.

The opposition to tithes seems to have developed in the 17th century as soon as the farmer began to produce for the market. Its mode of collection was at any time an obvious inconvenience. The farmer, anxious to gather in his harvest when the weather was seasonable and the crops at their greatest maturity, must have waited for the arrival of the tithing man with irritation. According to Prothero this source of annoyance had largely disappeared at the close of the 18th century. The Reports of the Board of Agriculture, he maintains, prove that comparatively little tithe was collected in kind. Although most enclosure acts included provisions for commutation, he would seem to have overestimated its extent, since a considerable acreage still remained in common field. However,

1. Clarke. History of Tithes. pp. 79-80.

it is certainly true that this no longer constituted the major ground of complaint. Whether it was levied in kind or in money, tithe was most disliked because it was a proportionate tax on total yield. For this reason it was alleged to constitute an impediment to agricultural improvement. Young described tithe as a tax on improvement, (1) John Payne, writing in the Annals, (2) and Benjamin Price in the Bath Papers, (3) as a tax on industry. Its effect in this respect was probably exaggerated. As Howlett said, it was not in the interest of the tithe owner to exact his full due. Agriculturists in this period were anxious to emphasise the financial burdens imposed on agriculture compared with those on manufacturing industry. Payne wrote:

> "I do not deserve proscription, because I have the misfortune to be a farmer". (4)

The same resentment was more forcibly expressed by another contributor to the Annals who wrote:

> "For it is not possible to devise any expedient either of poundage, corn rents or composition which can be attended with so much justice and constitutional liberty as salaries paid out of the public treasury. Were even the tax upon rents to be equal, if it included the rent of land, it would be like taxing the raw materials of a manufacture. This very disadvantage the land is now subject to by the illegal method of collecting the land tax which was directed to be levied on all goods and merchandise and personal estate, but by the superior sense and spirit of the commercial and monied interest they have reduced this part of the law and their share of the tythe laws to mere waste paper" (5)

1. Young. Farmers Letters. 1771. pp. 335-'6
2. Payne. Annals. XVII. 1792. p. 181.
3. Price. Bath Papers, vol. IV. 1788. p.103.
4. Payne. Annals of Agriculture, XVII. p.181.
5. Anon. Annals. XVIII. p.624.

There is some truth in this statement. The returns of agriculture, unlike those of industry, tended to diminish rather than increase proportionately to the amount of capital invested in improvements. Young estimated the average profit of the farmer at 10% on the capital employed. Whenever, therefore, the tithe owner chose to exact his full due, the drain of profits, especially those of the small farmer, may well have operated as a deterrent to improvement. As one of Young's correspondents pointed out, the use of substances whose beneficial properties were exhausted within a year, and whose cost had therefore to be replaced by one crop, was particularly affected by tithe.

> "..... but the fact is that the principle as well as the interest is to be returned in titheable produce and that frequently in one year. In this predicament are almost all light dressings, the capital and interest of which must be returned by one crop, it being allowed that the effect of them will not last any longer. From the use of such manures I consider everyfarmer whose tithes are taken in kind to be totally excluded".(1)

Waste cultivation may also have been impeded. The initial returns were very small in proportion to the capital invested; theoretically, by an act of 2 and 3 Edward VI, reclaimed land was for this reason exempt from tithe for the first seven years after improvement, but there were complaints that this law was evaded.(2)

With the growth of the urban market, both improved cultivation and more particularly waste reclamation assumed greater im-

1. Anon. Annals. XVII. p.107.
2. Hassall. Annals. XXII. p.641 also Thompson, 'Gentleman's Magazine' 1797. vol. 67. pt.2., p. 541.

portance for the Agricultural Interest. The tithe agitation correspondingly increased. Young records a meeting of gentlemen in London in 1773 for the purpose of petitioning Parliament to alter the tithe laws. Another took place at Exeter in 1792 with the same object.(1) Towards the end of the 18th century the annual payment of a tithe charge would, therefore, seem to have become a major grievance.

Hence when among the queries drawn up for the guidance of his surveyors Sinclair included "How best to excite improvement"?, he received an impressive consensus of opinion on the necessity for a commutation of tithe. Of the 55 reports which constituted the first survey for England and Wales, - Scotland was not concerned - 29 of these either complained of the deterrent effect of tithe on agricultural improvement or advocated a commutation. Among the authors of these reports were two clergymen, Abraham and William Driver, who surveyed Hampshire. In the remaining five counties, Somerset, Wiltshire, Oxfordshire, Bedfordshire, and Norfolk, tithe appears to have aroused little ill-will. Thomas Davies, the Wiltshire surveyor, who was a land steward to the Marquis of Bath, stated that some form of commutation had been widely accepted there. Thomas Stone, the Bedfordshire surveyor, commended the suggestion made by the Bishop of Lincoln for a commutation of tithe in his

1. Young. Political Arithmetic. 1774. p.19. and Annals XVIII. p. 464.

diocese. These expressions of satisfaction were thin, however, compared with the chorus of protest:(1)

> "In vain may Sir John Sinclair plan for the Kingdom at large the increase of arable culture (wrote a contributor to the Annals in 1793) unless the first result of its attempt be a clear statement to Parliament of the necessity for a full, adequate and permanent commutation of tithe".(2)

Likewise the need for some measure which would facilitate the enclosure and cultivation of waste land was emphasised in the Reports. The attention of the agricultural interest was drawn to this object in the late 18th century, when the growth of demand promised high prices which would make it economically feasible. It was undoubtedly a costly undertaking. A successful competitor for the waste land premium offered by the Society of Arts claimed in 1799 to have spent £5204. 8. 6. on improving 468 acres of Cheviot moorland.(3) Of these expenses the only item susceptible to substantial reduction was that of the enclosure proceedings. This was possible if some form of inclosure by agreement was substituted for the private act. In 1773, Sir Richard Sutton piloted through Parliament an Act to permit improvement in the cultivation of commons or open field by a majority agreement which would remain in force for six years. No great use appears to have been made of this Act: "It has not in substance or effect in any considerable degree liberated landed property from the shackles of partnership", wrote

1. Bath Papers vol. 8. and Stone: Bedford Report, p.59.
2. Annals. 1794. XXI p.344.
3. Society of Arts, Mss. Minute Book 1798-'99. pp. 27-29.

Stone. A further attempt to secure provisions for enclosure by agreement was made by Joliffe. On the 4th of March 1790 he introduced into the Commons a Bill for this purpose with the support of Sir William Watkin Lewes and Christopher Curwen. It was opposed on the ground that it stripped the poor man of his rights of common and rejected the same month.(1) "I lament with you the failure of Mr. Joliffe's Bill for promoting the preservation of our commons and waste lands", wrote Christopher Baldwin to Young as editor of the Annals, "and I lament it the more from a full conviction that it is now become absolutely necessary in order to afford food for the greatly increased number of people in this country, for increased they certainly are to a great extent notwithstanding all the croakings of gloomy philosophers".(2) Thus a large number of the county surveyors stressed the desirability of enclosure and three of them, Charles Hassall, Nathaniel Kent and Arthur Young commended to the attention of the Board the reduction of those expenses involved in application to Parliament for permission to enclose:

> "It is the wish of many persons that one object of the Board of Agriculture may be to introduce such laws as may facilitate the enclosure of such small wastes as, though well worth draining and liming, will scarce admit of the expense of an Act of Parliament".(3)

Previous to the receipt of the first County Reports the Board had made no pronouncement on either issue. It was in

1. Parliamentary Register. 1790. XXVII. pp. 196 and 319.
2. Baldwin. Annals. XVII. 1792. p.290.
3. Anon. Annals. XXI. p.550.

response to these expressions of opinion that Sinclair, as President, decided to take them into consideration and set up a Waste Land Committee. The minutes of this Committtee are unfortunately no longer extant, but the result of its deliberations were embodied in a report. So far as can be judged from this report it does not appear to have attempted to investigate the extent to which tithe or the expense of enclosure proceedings had in fact impeded waste improvement. Its purpose was rather to assume their deterrent effect and to argue the need for and determine the content of some measure which would alleviate it. The report was, therefore, in the nature of a preamble to the General Enclosure Bill. It pointed out that the idea of having lands in common was justified only by custom. It belonged to an earlier state of society and was not adapted to the advanced stage which contemporary agriculture had reached. But existing law provided no mode of enclosure less expensive than the Parliamentary Act. The Statutes of Merton and Westminster which permitted the Lord of a Waste to approve against his tenants, though still in force provided an opportunity for litigation by failing to define closely the stipulation that sufficient pasture should be reserved to tenants. Consequently, it was implied, out of a total for Great Britain of 49,436,160 acres, 18,000,000 were waste.(1) These figures, it was admitted, were inaccurate, since the Board had insufficient funds to conduct the necessary survey. Even so,

1. Sketch of a Report to be laid before the Board of Agriculture by the Committee on Waste Lands, etc. pp. 6 - 8.

the Board estimated that 3,000,000 acres could be put under tillage and that only 100,000 would be needed to provide the total imports for the 18 years ending in 1789.(1) Such a consideration at a time of scarcity, was, the report asserted, of national importance.

Accordingly, the first General Enclosure Bill which was introduced into the House on the 23rd of February 1796 specifically related to waste. This Bill never passed beyond the committee stage. The second General Enclosure Bill which had its first reading on the 9th of May 1797, after imports and an abundant harvest had relieved scarcity was wider in scope. Its provisions embraced the enclosure of common field and pasture as well as waste. The principle behind both bills, was, however, the same, to legalise enclosure by agreement. The 1796 Bill proposed that it should be possible to initiate enclosure at a meeting called at least 30 days previously by means of a notice pinned on the church door and published twice inthe London Gazette and some local newspaper.(2) In cases of complete agreement it should be necessary merely to enter the award with the Clerk of the Peace.(3) In cases of disagreement a three-fifths majority in value of those involved should be empowered to separate from the whole the land which belonged to them for division and enclosure.(4) Where the three-fifth majority was disputed

1. Sketch of Rept. op.cit.
2. Annals. 1796. XXVI. p.87.
3. ibid. p.86.
4. ibid. p.87-88.

by dissenting parties, the magistrates at Quarter Sessions were to be empowered to order a survey and so determine the matter.(1) The obvious objection to enclosure by consent of a majority in value was that it deprived the poor man of his rights of common. In anticipation of this objection the Bill provided that in every enclosure a portion of land should be set aside and vested in the parish for distribution to cottagers in the form of allotments as compensation for the loss of such rights as turbary.(2) Three acres and a cow was the Board panacea for the ills of rural society. It was advocated as a means of alleviating the distress of the labourer without raising wages or distributing parish relief. The Earl of Winchelsea, who had proved its efficacy on his Rutland estates, introduced the idea to the Board, but it was probably fairly widely current. The Earl of Egremont had provided his cottages with allotments, and Thomas Stone made a similar suggestion in his book on waste enclosure published in 1787. Pitt included the proposal in his abortive Poor Bill. However, these provisions would not seem to have obviated all objections to enclosure by majority consent without recourse to act of Parliament, since at some point in 1796 it was decided to withdraw these clauses from the main Bill. On the 9th of May 1797 two new bills were presented by Sinclair to the House. The first simply provided for enclosure by unanimous

1. Annals. op.cit. p.91.

2. ibid. pp. 96-102.

agreement of the interested parties; the second proposed in cases where the parties were not unanimous to enable any person or persons entitled "to any waste unenclosed, or unproductive land, common arable fields, meadow or pasture, or any portion thereof in that part of Great Britain called England, to divide, enclose and hold the same in severalty".(1)

Presumably no change was made in the clauses which related to tithe, since in 1797 Sinclair still regarded clerical opposition as the greatest threat to the Bill. In the 1796 Bill, tithe commutation was laid down without exception. The tithe owner, whether rector, vicar or lay impropriator was merely given a choice between modes of commutation, between an allotment of land or an annual rent charge.(2) As the Bill suggested, the latter was better adapted to the situation of the clergy who had little time for farming. Both Young and Howlett had rejected this solution, because it did not alter the nature of tithe as a proportionate levy on total yield and a tax on improvement. It was, said Howlett, not a commutation, but a successive ground for composition "leaving the grand objection to tithe on the part of the landed proprietors untouched, viz. the more rapid advance of the value of tithe than land".(3) This objection was not applicable to the rent charge proposed by the Bill. Its

1. H. C. J. 9th May 1797.
2. Annals. op.cit. XXVI. pp.104-108.
3. Howlett. An Enquiry concerning the influence of tithe on agriculture 1801 p. 43, footnote.

value in terms of grain was fixed. It would be reassessed every 14 years only in accordance with changes in the average price of grain during that period. On these lines the commissioners appointed by the 1836 Act finally carried through a general commutation of tithe.

These then were the principal provisions of the General Enclosure Bill which Sinclair introduced into the Commons in 1796 and 1797. He was aware that it would meet with powerful opposition from the law officers of the House and the representatives of the Church whose financial interests were affected. For this reason he sought, so far as possible, to secure for each widespread support and to present it as a national measure. His efforts were not completely unavailing. Both in 1796 and in 1797 he moved for leave to bring in a General Enclosure Bill as chairman of a Select Committee which included Government and Opposition supporters. Among the more noted members of the 1796 Committee were Pitt and Fox, Wilberforce and Whitbread, Coke and Dundas, Sheridan, Pulteney, Western and Pole Carew.(1) The following year the names of Pitt, Fox, Wilberforce and Pulteney again appeared in the list.(2) During the committe stage of the 1796 Bill, Sinclair further attempted to reach agreement with leading lawyers and clergy. In April 1796 he wrote to Pitt, asking him to call a meeting of the leading law offi-

1. H. C. J. 11th December 1795.

2. H. C. J. 22nd March 1797.

cers of the Crown for the purpose of settling the general outline of the Bill. He also intimated that he wished to submit it to the consideration of the Archbishops and Bishops, after which it might be drawn up in so complete a form as to render very little alteration necessary. "Every possible facility", he assured Pitt, "with ragard to tithes is given to the parties if they wish to agree, and if they don't, a mode is chalked out by which they may settle their differences at a Court of Law".(1) The law officers of the House were likewise assured that they would receive compensation for the fees they would lose if a General Enclosure Bill passed into law.(2)

Yet despite all these efforts the Bill "For Promoting the Cultivation and Improvement of the Waste Lands, Commons, and Common Fields, and other Commonable Lands in England and Wales by Agreement amongst the Parties interested", which received the assent of the Commons on 7th July 1797, was rejected in the Lords. Its rejection was commonly ascribed to the opposition of the Bishops. If so, their action may have proceeded from an irrational fear generated by events on the Continent, that the tithe proposals were but the prelude to a general attack on the property of the Church. A few misguided remarks of extremists possibly tended to promote this view. Thus a contributor to the Annals wrote:

> "Yet the French nation had but lately come to their senses on this subject; in due time and with proper exertions we shall follow their example".(3)

1. Pitt Papers. P.R.O, 30/8/178. Sinc. to Pitt. April 1796.
2. Parliamentary Register, XLIV. February 26th 1796.
3. Annals XVIII. p.622.

The commutation provisions in themselves, however, possessed advantages for the incumbent as well as for the farmer. Whilst ensuring his lawful dues, they relieved him of the onerous labour of collection and promised a more amicable relationship with his parishioners.

The defeat of the General Enclosure Bill was closely followed by Sinclair's displacement as President. This sequence of events may be purely coincidental. It is possible a majority of Board members were dissatisfied with Sinclair. The Board records' provide a hint of unrest. On June 16th during Sinclair's absence in Edinburgh, an extraordinary meeting was held attended by Lord Winchelsea, Lord Sheffield and Lord Carysfort, Sir Joseph Banks, Sir Christopher Willoughby, Robert Smith (later Lord Carrington), John Conyers and George Sumner. At this meeting a resolution was passed rescinding some measure of Sinclair's whose precise character cannot now be known owing to the loss of the early minute books, but which appears to have concerned printing. The measure was cancelled on the ground that it was "against the preceeding resolution of the Board, and also from an opinion that the funds of the Board are not in a situation to bear expenses which may as in the case of Mr. Stone (the Bedford and Lincoln Surveyor) prove very uncertain".(1) This resolution was followed by circular letters to people who had been

1. Bd. Mss. Letter Book, 16th June 1796.

asked to help with the county survey or to write a paper on some specific subject, informing them that the Board could not be at any expense but would be grateful for gratuitous assistance.(1) Even so, the balance against the Board in February 1797 amounted to £1,027. 3. 1d.(2) In March, Sinclair was accordingly requested to furnish the Committee on expenditure with an account of such articles as had not been recommended by the Board.(3) The following week the account was presented and showed an unauthorised expenditure of £403. 16. 11d., out of a total of £3,531. 6. 11d. It was then resolved that in future no expenses should be incurred whilst the Board was sitting without its authorisation, and during the recess "no greater latitude was to be given to the President than from £50 to £100". It was also resolved to look for a house, "that the Board may not continue to be such a burden on the zeal of the President as they have hithertoo been".(4) These resolutions were followed by a curtailment of printing and a close examination of the financial claims of the surveyors. But the Board was not speedily restored to solvency, for when Somerville succeeded Sinclair as President, it was still in debt and still preoccupied with the separation of authorised from unauthorised expenditure.

1. Bd. Mss. Letter Book op.cit. p. 167 and p.171.
2. Minute Book of Finance Committee. 24 February 1797.
3. ibid. March 3rd 1797.
4. ibid. March 3rd and 6th 1797.

Yet if Sinclair's defeat truly represented the feeling of the Board, it is difficult to account for the large attendance of official members.- Seven were present. They included the Archbishop of Canterbury and the Bishops of London and Durham, a weighty representation of the Church; the Lord Chancellor, Lord Chatham, the First Lord of the Admiralty; Lord Cornwallis and the President of the Royal Society.(1) - Their intervention would not have been necessary. Moreover Sinclair was defeated by only one vote. They most probably tipped the scale. The opinion of contemporaries that Sinclair lost the Presidency because he had been so rash as to associate himself with a controversial political measure cannot, therefore, be discounted. "But perhaps the Minister did not approve of so much activity in a President of the Board of Agriculture", wrote the author of Public Characters. The "Practical Farmers" were more specific:

> "With regard to the first (i.e. General Enclosure Bill) surely, my Lord, it wanted no ghost to tell Sir John Sinclair that whatever measure tends materially to abridge the fees of the House of Commons tends also to cramp the patronage of the Minister and that such a measure is not only sure to be negative, but even to bring down vengeance on the head of the projector. It is not for us, my Lord, to impute the removal of Sir John from the high office of President of the Board for his daring to agitate such questions".(2)

If so it was from Pitt's point of view justifiable. Sinclair had created a situation of which it could be said that the Board had allied itself with sectional interests hostile to the Church

1. Minute Bk. of Finance Committee. op.cit. Rough Minute Book 1798-'99 March 27th 1798. pp.34-35.
2. A letter to Lord Somerville 1800 pp. 2-3.

establishment. Such was the opinion of the Rev. Morgan Cove:

> "It will, therefore, well become the Board of Agriculture ..... to consider whether some parts of its past conduct may not have given rise to suspicions relative to alterations in tithes, which are unfavourable to its honour and integrity as a Public Board". (1)

It is also possible that Pitt disliked the tendency which the Board had shown to become a focus for the political demands of the Landed Interest and held Sinclair responsible for it. In 1795, Sinclair had circulated among the magistrates a printed letter. The occasion of this letter was the success of his address in the House of Commons for a public grant to Joseph Elkington of £1,000 on the publication of his draining technique. Its purpose, however, was to present this information as "proof of the attention which the Legislature is fortunately at present disposed to pay to the Agricultural Interest of the country" and to proclaim that the Landed Interest "in promoting the improvement of the country have also the means (presumably the Board) of making applications to the Legislature in a manner most likely to secure attention and success" (2) Several communications requesting it to intercede with the Administration for the remission of taxes on substances used in agriculture were afterwards received by the Board. Two came from the Manchester Society in February 1796 for the repeal of duty on salt used as manure and on bricks for drainage purposes. (3) Likewise,

1. Cove. An Inquiry into the Commutation of Tithes. 1800 pp.27-28.
2. Sinclair. Circular Letter to Magistrates. 1795. pp. 1 and 3.
3. Bd. Mss. Minute Book of Miscellaneous Committees. p.51 12th February 1796.

Thomas Buckley and Mr. Bucknall wrote recommending a drawback on draining bricks, and the Hon. W. Cochrane suggested a means of preventing frauds if the duty on salt was removed. Other requests for the removal of the import duty on linseed cake, a substance used in fatting cattle, and of the recent turnpike toll on lime used as a manure were received in February 1796 and May 1797 respectively.(1)

In conclusion, the Board was established at a time of considerable discontent among the Landed Interest. Already they were aware that the rate of progress in manufacturing industry was greater than in agriculture. This circumstance intensified the resentment which had for some time been directed against such survivals of an earlier age as tithe, common fields and common rights which impeded the enterprise of the farmer. No organisation, however, existed to co-ordinate their grievances. When, therefore, the Board of Agriculture, as represented by Sir John Sinclair, declared its intention of bringing the needs of agriculture before the attention of Parliament, it found the Landed Interest ready to use it as an instrument for the furtherance of their claims.

1. Bd. Mss. Minute Book of Miscellaneous Committees. pp. 54-59. 12th February and 11th March 1796.

CHAPTER 5

SOMERVILLE'S NEW POLICY

The failure of Sinclair's Bill did not mark the end of all attempts by the Board to secure a General Enclosure Act. In 1800 it was resurrected in response to ten resolutions sent to the Board by the Grand Jury of York.(1) Fortified by favourable resolutions from the Grand Juries of other counties whom it had circularised on the subject(2) the Board in the person of Lord Carrington, at that time its President and also Chairman of the Lords' Committee on the High Price of Provisions, presented the Bill once more to the Upper House. Once more it was defeated and the activities of the Board represented as "inimical to the Church establishment".(3)

But this event merely re-emphasized the lesson which had first been made plain in 1798, namely, that the Board was expected to confine its attention to the purely technical requirements of agriculture. This fact alone, apart from the personal interests and opinions of Sinclair's successor, Lord Somerville, involved a change in policy at this point.

The promotion of technical improvement had by no means been overlooked by Sinclair. He was as aware as any other contemporary observer of the disparity between the practice of one farmer and another. But, characteristicaly, he proposed to remedy it by abstract-

1. Bd. Mss. Minute Book 1798-1805. facing p. 121 Resolutions of the Grand Jury of York.
2. ibid. Letter Book 1795-1800 pp.422-423.
3. ibid. Minute Book 1798-1805. p.392.

ing from the county surveys, the subject matter for a General Report which should bring within the reach of every farmer the quintessence of existing knowledge on all the principle operations of husbandry.(1)

Before Sinclair's first presidency ended, the report had been planned and very partially composed. Two chapters were published in 1795 in the form of separate reports. One of these concerned manures and the other potatoes. Both were doubtless hastened by the occurence of scarcity which gave to the growth of potatoes and the cultivation of waste a temporary urgency.

The manure report was presented to the public as merely 'the sketch of a chapter to be circulated for corrections and additonal remarks'. It was compiled by Robert Somerville, but a number of chemists and scientific societies, among them Kirwan, Dundonald, Darwin, Dr. Hunter of York and the Royal Society of Edinburgh, were asked for comments and may have contributed to it.(2) The manure committee certainly received from Ingenhausz a letter 'On vegetation and manures'.(3) A short resume was given of the conclusion which had been reached on plant nutrition by Priestley, Cavendish, Ingenhausz and Hassenfratz and reference made to a paper of Kirwan's in the Irish Philosophical Transactions of 1755 and Dundonald's 'Agricultural Chemistry'. By this time plant food was understood in terms of chemical substances particularly alkaline salts and carbon.

1. Sinclair. Address to the Board of Agricultue, 1794. Communications. op.cit. I. Appendix K.
2. Board Mss. Letter Book. 10th May 1796.
3. Bd. Mss. Letter Book. 6th February 1795. p.9.
4. ~~Manure Report, 1795 p.9.~~

Tull's theory of the absorbtion of terrene particles was completely discredited. At the outset the Board report disclaimed the contention that frequent tillage obviated the need for manure though it was useful as a means of extirpating weeds and producing a good tilth. Kent's theory that manures could be dispensed with on land kept under a well regulated rotation of crops and correctly stocked was likewise rejected. Manures, the report asserted, were essential to correct what is hurtful to vegetation in different soils and to restore what is lost by exhausting crops.(1)

Its raison d'etre once established the report proceeded to consider the mode of application and effect of every type of manure in common use. It was a lengthy list including farmyard dung, vegetable substances like green crops ploughed in, seaweed and peat moss, lime, chalk and marl and more recherché mineral substances like soap, ashes, shells and gypsum. In general the report advised the application of manures as a top dressing so that the valuable salts should not be washed through to the substrata and lost. Quick lime on young plants was excepted on account of its caustic properties. A large part of the report was devoted to the use of lime in its various forms, its value as an agent for the decomposition of other substances was emphasised. The affect of lime and other calcareous substances on vegetation was described 'as perhaps one of the most valuable and extraordinary discoveries that agriculture has to boast of'.(2)

1. Manure Report 1795. p. 9.
2. ibid. p. 54.

There was little new in the report, and little of any practical use to the farmer, save perhaps for some advice on the construction of dung heaps. Most of the manures mentioned with the exception of gypsum were known to Sir Richard Weston. No positive advance in their use could in fact be made until chemical knowledge was great enough to make possible the analysis of soils and the substances contained in them. This was recognised in the report itself. After surveying the field of existing knowledge on the subject, the report ended humbly by acknowledging its inadequacy:

> "But more facts are wanting to form a theory of important application in practice. Experiments are wanting to show the substances contained in different soils, to explain the comparative powers of different substances in nourishing matter which can be produced in different circumstances".(1)

The report on potatoes was a digest of information culled by the Board from the most reliable sources of agricultural information, namely the County reports, the transactions of the Society of Arts and the Bath Society, the experiments reported to the Dublin Society, the Georgical Society and Board Manuscripts. The leading varieties of potato were detailed, i.e. oxnoble, champion, surinam, kidney, blackamoor, killamancas, round red and round white; the different methods of planting such as lazy bed, dibbing and drilling were described and some account was given of expense and use, particularly as cattle fodder. But the Board made no attempt to pronounce on the type of potato or the mode of cultivation which should

1. Manure Rept. op.cit. p.89.

yield the heaviest crop. It reserved its opinion on the ground that experimental evidence, taking into account the soil and the manures used, was insufficient to support any general conclusions.(1)

One further chapter appeared as a report on the art of draining. It was an account of Elkington's technique, written for the Board by Johnston. Elkington was a Warwickshire drainer who had successfully conducted several drainage operations in the Midlands by tapping the main spring and successfully leading off the water to the nearest watercut or river. His methods were hailed by the Board as a solution to the problem of deep drainage. On this ground, Parliament was persuaded to offer Elkington £1,000 in return for a public exposition of his system.(2) Unfortunately he worked primarily by instinct and does not appear ever to have been able to explain his technique sufficiently clearly to obtain the grant.(3) Geological knowledge was at that time insufficiently advanced for the formation of different strata to be determined accurately. The first effective method of deep-drainage which could be generally practised was evolved by Smith of Deanston.

These three fragments were all that ever materialised of the great report. Somerville's chapter on livestock and those which were to have been undertaken by Sinclair and Young were never written.

1. Board of Agriculture. Hints on the Culture and Use of Potatoes 1795. p.28.
2. Bd. Mss. Minutes of Misc. Committee on Draining, 10 June 1795. p.34.
   Board of Agriculture. Circular letter to Magistrates. 30th June 1795.
3. Bd. Mss. Rough Minute Book. 27th February 1798, p.16. also Letter Book 27th February 1798, p.233. Board to Lds. of Treas.

Apart, however, from this major project Sinclair in numerous ways sought to make the Board a centre of information drawn not only from Great Britain but as wide an area as possible. Its position as a public institution gave him an initial advantage of which he made some use. When in ~~May~~ March 1796, the Board, for some reason unstated, wanted a Leicester sheep, the Leicester Agricultural Society was requested to send one.(1) This animal was then a subject of much controversy. Opponents maintained that to produce it Bakewell had sacrificed fleece to flesh. Increasing imports of Spanish wool towards the end of the century had focussed the attention of breeders on fine wooled sheep. Opinions differed about the possibility of combining both qualities in the same animal. The request made by the Board of Edward Coleman, head of the newly established Veterinary College, at about the same time, for information concerning the animals with the greatest propensity to fatten was possibly connected with the foregoing considerations.(2)

In like fashion individuals who might be expected to possess information on a particular field were occasionally requested to furnish the Board with papers on related subjects. Dr. Pearson was Professor of Agriculture at Oxford during this period. In January 1797 he was asked to furnish the Board with some remarks on vegetation and obliged with a paper on the 'Ultimate elementary parts of vegetables'.(3) Dr. Fordyce, a chemist was asked for a paper on

1. Bd. Mss. Letter Book. 17th March 1795, p.19.
2. ibid. 24th May 1796, p.138.
3. ibid. 24th January 1797, p.176.

manures,[1] and the Duke of Buccleuch for one on Bakewell's farm.[2]

Sinclair's pursuit of information was not confined to this country. He had a vision of an international agreement for the exchange of agricultural information which should operate through national boards of agriculture. An international fund for the reward of improvements was also suggested, but as uaual with Sinclair's ideas no details of its proposed administration were provided.[3] This plan he communicated to the Economic Society at Berne and received from its secretary, Mr. Kirchbergen, an assurance of co-operation.[4] It is not therefore surprising that during his first presidency he sent lists of queries to European agriculturists whose aquaintance he had presumably made during his continental tour.

Of T. H. Fink, a member of the Saxon Society of Agriculture, G. G. Marwedel of Brandenburg, Baron David Schulz of Schulzenheim, Count Alexis Orlow Chesminsky of Russia and General Washington, he inquired about sheep, the species kept, their management, the quality of their wool and the weight of the fleece and the carcass.[5] These were questions which aroused considerable discussion among English farmers at that time. They were still undecided about the most beneficial and profitable management of sheep on a mixed farm whether folded or penned. With these considerations such breeding points as length of leg were connected. Also despite the popularity

1. op.cit. 24th May 1796. p. 135.
2. ibid. 24th January 1797.
3. Sinclair. Plan of an Agreement among the powers in Europe, etc. Annals of Agriculture XXVII. 1796, p.42.
4. 'Communications to the Board of Agriculture' I. p.348.
5. ibid. p.306. and p.346.

which John Ellman in particular had secured for the Southdown sheep they were anxious to discover a breed whose fleece could rival that of the Spanish merinos. Sinclair was personally interested. On his Scottish estates he had experimented successfully with a flock of Cheviot long-wools, crossing them with the native Highland breed in order to improve their fleece still further. Some years later during his second presidency he went to considerable trouble to procure through the agency of the East India Company a few specimens of Thibetan sheep whose wool was reported to constitute the raw material of cashmere cloth.(1) The replies to these queries, if any were received, do not appear to have survived.

Other queries concerned tillage, the rotations followed, the manures considered best and the artificial grasses cultivated. To these the Board received answers from the Jersey Agricultural Society, the Free Economic Society of Petersburgh, and two inhabitants of the Netherlands, the Abbé Mann and Baron Poederlé.(2) Flemish agriculture perhaps because of its intensive character had long been a subject of interest to English agriculturists. Soon after the cessation of war Sinclair visited the country to survey its agriculture and record his impressions in an "Account of the Husbandary of the Netherlands". In particular the stall feeding of cattle attracted much attention. The Abbé Mann in his answer to Sinclair's queries, commented on its suitability to small farms where manure was particularly valuable.

1. Bd. Mss. Letter Bk. June 8th 1810 p.22. Bd. to Warren Hastings
June 12th 1810 p.31. " " Adm. Bentinck
July 6th 1810 p.34. " " Wm. Astell.

2. Communications. op.cit. p.236 and p.331.

But the Board did not confine its correspondence with foreign agriculturists to queries. Copies of its publications were also sent. Its correspondence with America in particular took this form. Washington, Jefferson, and the Agricultural Society of Massachusetts all received one or more of the Board reports. In return the Massachusetts Society and also the New York and New England Societies sent parcels of books and transactions.(1) Jefferson s ent a paper on the construction of mould boards whose ideas are considered by Mr. Fussell to have been borrowed from the Rotherham plough,(2) and Washington sent a cheque for £10 which Sinclair, with the consent of the Board, grandly returned to him in the form of a complete set of county reports handsomely bound.(3)

Besides these gifts from America the Board also received one or two parcels of pine seeds from Russia.(4) During the war period such foreign correspondences as the Board received came principally from these two countries. After the conclusion of hostilities it established contact with societies at Paris, Toulouse, Dijon, Ghent, Brussels, Mecklenburg and Vienna.

Within the country the communicati ons it received were, of course, much more numerous and more varied. They ranged over the entire field of agriculture. Sometimes they described a new implement; then the Board asked for a working model or arranged a trial. In 1796 James

1. Bd. Mss. Letter Bk. April 19th 1796 p.96. and May 24th 1797 p.201.
2. Fussel. The Farmers Tools. London 1952. p.45.
3. Bd. Mss. Rough Minute Book February 13th 1798 p.5.
   Letter Book. February 20th 1798. p.227.
4. Minute Book 1805-1808. April 29th 1806, p.105. and
   February 24th 1807, p.155.

Watt wrote to the Board about a handmill he had designed, and William Amos about a reaping machine.(1) The handmill received the recommendation of the Board. Sometimes correspondents wrote about a new preparation for wheat, the effect of a specific manure or an exceptional crop. Sometimes they described some project of drainage or waste improvement. Thus in 1797 Robert Somerville sent a treatise on enclosing land and the Right Honourable Thomas Pelham some specimens of the root of dibbled wheat. Usually the Board resolved to keep these papers and sometimes wrote for fuller details.

In these ways, through its surveyors and its correspondents, the Board must have acquired more information about farming throughout the country than that possessed by any other institution. But its utility was restricted to those who could read and thus it tended to instruct the instructed. The Board had not established a correspondence with any of the existing agricultural societies. During the negotiations with the Treasury for a drawback on draining bricks and on salt used as a manure, it was in touch with the Manchester Society and during the proceedings for a General Enclosure Bill it received assurances of support from several others.(2) But it was not in frequent or regular communication with any of them. They seem, at first, to have regarded the Board more as an intermediary with the Government than another agricultural society.

1. Bd. Mss. Letter Book 1793-1800. March 8th 1796. Board to James Watt, p.69. April 19th 1796, Board to Wm. Amos, p.91.
2. Bd. Mss. Minute Book of Misc. Committees, Feb. 12, 1796, p.51.
Letter Book February 9th 1796 Board to Cornwall Society, p.48.
February 17th 1796 Board to Kent Society, p.51.
March 1st 1796 Board to Leicester Society.

Moreover, during its early years, no premiums were offered by the Board which would have served as a link with the ordinary farmer and a means of influencing the ordinary operations of husbandry. Pitt, probably for reasons of economy had apparently stipulated that no premiums should be given at the outset of the Board's activities.

These were the innovations which Lord Somerville determined to introduce into Board policy when, in 1797, he succeeded Sinclair as President.

Lord Somerville to a much greater extent than Sinclair was a farmer. Sinclair, it is true, was keenly interested in sheep and by his discovery of the Cheviots he introduced into the Highlands an animal which could both exist in arduous conditions and produce a thick fleece, but farming was only one of several interests between which his attention was divided. Much of his time was spent away from his estates, in Edinburgh or London, compiling his Statistical Account of Scotland, writing pamphlets or attending the House of Commons. For Lord Somerville, on the other hand, agriculture was the only major interest. He possessed an extensive estate in Somerset. Next to George III he became the largest breeder and owner of Merino sheep in the country, and by crossing with Rylands and Southdowns produced on Anglo-Merino breed whose wool gained a considerable reputation. He was also well known for a double-furrow plough whose merits had been proved on the Royal farm at Windsor. Among his friends was numbered the Duke of Bedford. Both were members of the Bath Society and for several years its principal officers with Bedford as President and Lord Somerville as

Vice-President. Somerville was also chosen to serve as President of the newly founded Smithfield Society in 1798.(1) It is not, therefore, surprising that he should have conceived of the functions of the Board in practical terms.

Accordingly, on succeeding to the presidency he immediately curtailed the Board's volume of printing and proposed that in future it should be limited to an annual volume of "Communications". Of this Young, who complains of Sinclair's excessive zeal for publication, must almost certainly have approved though perhaps for different reasons. Young criticized the quality of much that Sinclair saw fit to print.(2) Somerville criticized the printed word itself as an effective means of raising the general level of farming. "Farmers", he observed, "are not a reading class of people".(3) In its place he proposed to use ocular demonstration and the premium, both as a vehicle of simple instruction and an incentive to innovation.

Ocular demonstration was to be provided on a national farm. Part of it was to be set aside for experimental use but its main purpose was to provide a model of improved husbandry.(4) Arthur Young held similar views. When consulted by the Durham Society about the value of an experimental farm, he replied that its purpose should be "the ascertainment only of plain practical questions".

1. Clarke (E.) Journal of the R.A.S.E. 1897. 3rd series viii pp. 1 - 20.
2. B.M. Ms. Add. 34, 855. Young 'The Elements and Practice of Agriculture' I.
3. Somerville (John) The System followed by the Board of Agriculture during its last two years. 1800. p.17.
4. Somerville. System ibid. p.15.

"I would allow of no laboratory, no botanic garden, no deep scientific pursuits".(1)

The idea of an 'economical'or model farm was not new. It formed the substance of Marshall's proposals for a Board of Agriculture which he incorporated in his Rural Economy of the Midland Counties published in 1790.(2) But is is difficult to imagine that such a farm could have exerted much influence on agricultural practice generally at a time when travel was still a rare undertaking for all but the weal-to-do. As the 'practical farmers' remarked in criticism of Somerville's ideas, the attempts of Board members to make their own estates an example of progressive husbandry would have been better adapted to this purpose.(3) The Durham Society expressed a similar opinion. They considered a farm "which is a model of rural economy, within the reachto some degree of every gentleman who cultivates a portion of his own property".(4) Marshall, to some extent, provided for this objection by suggestion a public seminary should be attached to the farm to give instruction in the principles of Rural Science,(5) but Somerville included no such proposal in his plan.

The premium which constituted the second item in Somerville's policy was simply a reward sometimes pecuniary, sometimes honorary, for a specific object. It was given by societies both in England

1. Young. Annals XXVIII. p.288.
2. Marshall. Works V. 1790 pp.123-'4 and p.128.
3. 'A Letter to Lord Somerville by a Society of Practical Farmers 1800 pp.42-43.
4. Annals. XXXI p.102.
5. Marshall. op.cit. p.12[illegible].

and on the continent to stimulate inventions and improvements and sometimes to obtain information. It was first used extensively in England by the Society of Arts but in various parts of the country local agricultural societies followed suit. The objects for which they were offered differed slightly according to the size of the society or the district in which it was situated. Larger societies like the Cardigan, the Manchester or the Bath and the Society of Arts drew up long and miscellaneous lists. They usually included premiums for timber, sheep and cattle, waste improvement, the use of new rotations like wheat soon after beans, or vetches, or a buck-wheat fallow, the cultivation of new crops like carrots, cabbages and artificial grasses, particulary for fodder, and for implements, especially ploughs and drills. The smaller societies whose premium awards were much more limited concentrated on the improvement of livestock or of tillage according to the predominent type of farming in their district. Thus the Norfolk Society offered premiums for "the largest area of heavy clay drained or sanded", "the best crop of wheat, barley and oats" and for experiments to ascertain "the best method of preserving turnips from the fly" or of "preventing the failure of clover" whilst the Sussex Society with its hinterland of downland offered premiums for prime beasts, bulls, heifers and Southdown sheep and held an annual show at Petworth to determine the award.(1) Ploughing matches were widely held and almost all societies large and small sought to improve the poor. They offered premiums to stimulate their industry, - 'to three labourers earning

See: Annals of Agriculture for premium lists of Durham, Kent, Cardigan, Bath and Manchester Societies.

1. 'Premiums offered by the Society for the Encouragement of Arts Manufactures and Commerce' 1754-1776.
Premium lists of W. Riding, Manchester, Sussex, Norfolk and Odiham Societies in Goldsmiths' Library, University of London.

with the assistance of their families most money during harvest proportionate to the rate of pay, - 10 guineas,[1] - premiums to encourage provident procreation, - 'to five labourers bringing up most children to the age of two years in habits of industry without parish relief - 15 guineas,'[2] and premiums to weaken the desire for a change of master, - 'to the ploughman, carter or farmer's manservant who has served longest in one place, - a silver medal!'[3] This kind or premium reflects contemporary social problems. Even though a widespread movement of population from country to town is no longer generally considered to have taken place, the higher wages earned by the artizan undoubtedly constituted an attraction to the rural labourer living in the vicinity of a manufacturing centre. Hence the attempts of the provincial societies to encourage length of service. Likewise, the rapid growth in poor law expenditure during thelate eighteenth century prompted numberous expedients to keep people off the rates, of which the cottager and cow policy advocated by the Board of Agriculture is one of the most notable.

Since, therefore, the premium was a well-established means of influencing farm practice and encouraging improvement in various parts of the country, the utility of such awards by a national

1. Sussex. Sgricultural Society. Premium List, 1798.
2. Sussex Agricultural Society. Premium List 1798: see also Annals XXX. p.12; Premiums of Wrexham Society; Annals XXIX p.29. Premiums of Cardigan Society.
3. Manchester Society, Premium List, 1774.

society like the Board would depend on the extent to which it could be made to serve a wider area or more advanced objects. The value of bringing livestock and also machinary into competition on a national scale by means of premiums similar to those offered by the early provincial societies has been demonstrated for over a century by the Royal Agricultural Society. Thereby breeders and implement makers have become acquainted with each other's work and gained the knowledge and incentive to improve their own. It was also, however, peculiarly within the province of a national society which was not dependent on the financial support of its members to encourage with monetary rewards experimental research. Further improvements, particularly in tillage, depended onvariations, according to the nature of the soil in the use of manures and the rotation of crops. A few premiums of this kind were already included, before the end of the eighteenth century in the premium lists of the larger societies.

But Somerville seems to have had in mind the former object. He envisaged a premium policy similar in kind to that of the provincial societies but on a larger scale. Admittedly, he suggested that premiums of £50 or £100 should be offered "for discoveries and improvements in the most important and leading parts of husbandry", but with the provision that preference should be given "to such as by ocular demonstration rather than by certificates be ascertained,"(1) which tends to exclude experimental investigations. The objects more specifically mentioned by Somerville were the provision of

1. Somerville. System. op.cit. pp.10.11.

better cottages for the poor, the encouragement among them of providence and settled employment and the improvement of implements and livestock.. Somerville asserted that the Smithfield Society was established in 1798 as a consequence of the Board's inability to give premiums.

Finally, Somerville suggested that the Board should constitute itself the centre of a network of provincial societies. These he regarded as channels of communication through which the Board could inform the practice of the plain farmer. As the existing societies were few in number compared with the extent of rural England, this idea involved the artificial establishment of farming societies throughout the country.

These three proposals form the substance of Somerville's 'System'. Such a policy would, he considered, regain the confidence of farmers and make the Board the fountain-head of agricultural improvement.

CHAPTER 6

THE BOARD AS AN AGRICULTURAL SOCIETY: ITS ACHIEVEMENT

The impact of Somerville's proposals on the character of the Board was for various reasons far from radical. His presidency certainly produced in its activities an increased emphasis on the minutiae of technical improvement, but it failed to transform the Board into a really practical body. Had Somerville held the office of President for longer than two years he might have achieved more, but lack of money would still have constituted a major obstacle. Almost half the Grant was paid out each year in official fees, rates and taxes, expenses connected with the house and salaries. Moreover, Sinclair had left the Board with debts amounting to almost £3,600.(1) Hence no attempt was ever made to implement the proposal of a national farm. The Durham Society estimated the initial cost of such a farm at approximately £1,550, a sum far beyond the available resources of the Board.(2)

Somerville's proposal for the establishment of provincial societies likewise proved abortive, but an attempt, at least, was made to carry it out. At Somerville's suggestion the Board proceeded to frame an overall plan. Where possible it drew on the local knowledge of its members. Sir Joseph Banks was asked to indicate suitable places in Lincolnshire. In several places agricul-

1. Bd. Mss. Minutes of Finance Committees. February 22nd 1799.
2. Annals. 1796. vol. XXVII. p.205.

tural societies already existed. They had been established at Bath (1776), Manchester, Norfolk (1777), Odiham in Hampshire (1786), Leicester, Wrexham and Melford in Suffolk, and in the counties of Sussex (1772), Devonshire (1791), Kent (1793), Cardigan (1796), Durham and Cornwall. Within their respective spheres of influence the Board wisely sought to win their co-operation rather than to encroach on their authority. "The Board would not proceed with this plan within the limits of the Bath Society without consulting that respectable establishment". They wrote to the society on April 23rd 1799.(1) Similarly in reply to a letter on the subject from John Ellman, the celebrated breeder of Southdowns, "Sir Godfrey was requested to propose the appointment of a committee of the Sussex Society to correspond with the Board and to desire that they will name any district in Sussex in which they conceive subordinate societies upon the plan of the Board might be established without interfering with the county society at Lewes".(2)

Elsewhere the Board sought to promote the establishment of such societies by asking local dignitaries to undertake the task. Letters of this kind were sent, among others, to the Earl of Carlisle, the Rev. John Howlett, the Duke of Richmond and the Earl of Aylsford regarding projected societies at Malton, Dunmow in Essex, Chichester and Coleshill respectively.(3) The request was not always complied

1. Bd. Mss. Letter Book April 23rd 1799. p.339. Somerville to the Secretary of the Bath Society.
2. Bd. Mss. Minute Book May 21st 1799. p.69.
3. ibid. June 11th 1799. pp.75-'6.

with. Both Howlett and the Duke of Richmond declined to participate in the scheme, though in the latter case Lord Clarendon agreed to attempt the task.(1) Such refusals may characterize the general tenor of the landowner's response to Board requests for their co-operation. A few offers of assistance were received from interested individuals, like John Boys, the author of the Kentish Report, at least one of which bore fruit in the establishment of a society at Retford by a Mr. Eyre.(2)

It is difficult to estimate the degree of success attained by the Board in this policy, for although, according to lists published in the Annals and the Bath and West Papers, the number of agricultural societies in Great Britain increased from twenty-eight to sixty-two between 1803 and 1810,(3) the establishment of only five, all in 1800, can be definitely attributed to Lord Somerville's appeal from evidence contained in the minutes. These were the societies of East Monkland near Aindrie,(4) Newark,(5) Retford, Boston, and Christchurch. Presumably, however Loveden resuscitated the Berkshire Society in 1800 and the Duke of Bedford founded a local society in 1801 in direct response to the Board's campaign.

1. Bd. Mss. op.cit. June 11th 1794. p.75.
2. ibid. May 21st and June 11th, 1799 and January 21st 1800 pp. 69, 75 and 82.
3. See Appendix 5.
4. Bd. Mss. Letter Book. 1793-1800 p.364.
5. ibid. Minute Book. January 21st 1800 p.82.

The extent to which the Board maintained a correspondence with these societies is equally difficult to determine. So far as can be ascertained from the manuscripts which are extant, it was extremely slight. The only letter of a consultative nature recorded in the minutes is a query from the Newark Society about the cause of smut in wheat. In reply the Board sent extracts from their publications and in translation from "Le Tessier sur les maladies des graines" with the comment that it would benefit the public if other societies would do likewise.(1) Otherwise the Board received only an occasional list of premiums sent most frequently by the Bath and West and the Newark Societies. Yet Sinclair in 1806 stated thatit was in correspondence with about thirty societies.(2) Either the minutes which are complete for the period form an incomplete record of correspondence received or Sinclair was referring to the annual despatch of premium lists by the Board to every agricultural society in the Kingdom with whose existence it was acquainted.(3)

The third and final part of Somerville's system was given some substance. In 1801, the Board published its first premium list. The most noticeable feature of this and subsequent lists is the preponderance of premiums which required a written account. A few of these related to topical issues which particularly affected the land and its owners. Thus the 1801 list included premiums for the "most

1. Bd. Mss. Minute Book. February 9th 1802. pp.264-265
2. Sinclair. Address to the Board. 1806.
3. Bd. Mss. Minuute Book. March 26th 1801 p.197.

satisfactory memoir on the means of obviating the objections to the General Enclosure Act" - "the best essay suggesting a means of making the cottager and cow system general throughout the kingdom" and suggestions for "the amelioration of the conditions of the poor - without materially increasing the poor-rates". But the majority of awards were offered for an account of experimental inquiries into some specified point of practice.

The effect of different manures was a frequent topic. In 1800 a premium was offered for an essay on the nature of manures and the principles of vegetation verified by 'chymical experiments'. This premium was continued until at least 1812. In 1803 another was offered for an account of experiments in the use of salt, in 1806 for experiments in marling and chalking clay land and also on the use of peatmoss and burnt clay, and in 1809 for an account of gypsum used as a manure. Another group of premiums concerned planting. Four were offered in 1801 for accounts of experiments to ascertain the correct quantity of seed to be used per acre for wheat and oats respectively sown broadcast or dibbled on a clover ley. In 1803 a similar premium related to barley.

The feeding of livestock was another subject on which the Board seems to have been particularly anxious to obtain exact information. The 1806 list contained a premium for an account based on experiment of the comparative effect on different animals of foods like natural and artificial grasses, hay, chaff, corn, pulse, oil-cake, cabbages or roots. A few years later, the value of muscovado sugar for fattening cattle was made the subject of a premium, also the practice

of soiling or feeding stalled cattle on green food.

Other premiums related to the best preparation for wheat, the effect of paring and burning, the comparative advantages of using horses and oxen in the general business of the farm, and the diseases of cattle, sheep and swine.(1)

None of the practices to which the Board attempted to direct enquiry were novel but some were controversial. Paring and burning, a method of preparing land for tillage by removing the surface sods, burning them and mixing the ashes with the soil was an old West-country practice, known, says Prothero, as Devonshiring but it was still regarded with distrust in other parts of the country. "Sod burning", wrote Marshall, "appears to be one of the sources of real improvement which being yet imperfectly understood require every effort of the farmer and philosopher to raise them nearer to perfection."(2) Gypsam was another manure whose use aroused contention in America as well as in England. Priestley thought it of sufficient interest for experimental investigation.

Such premiums as the Board offered for positive achievements mostly concerned extensive projects, especially the improvement of the land. The 1801 list included awards for the greatest number of acres brought to the annual value of ten shillings an acre, and the largest acreage watered in an area where irrigation was not

1. Premiums offered by the Board of Agriculture 1800-1818.
2. Marshall. Works XI. 1788. p.311.

generally practised. Both these premiums were continued for several years and another of like kind relating to deep drainage was offered in 1809.

Until the very end of the Board's life, no premiums were offered for livestock, probably because their adjudication would have involved the holding of a show and the energies and resources of the Board were otherwise directed. Only a very few premiums were offered for new implements, for a cart in 1801, a reaper and a machine for crushing limestone in 1806, and a drill in 1809. Possibly this was considered the province of the Society of Arts. Since 1761 this Society had annually encouraged by premiums the improvement of farm implements. The design of a draining plough and a root-cutter was prompted by its awards. Likewise, the turnip slicer originated with the Society and the invention of a chaff-cutter owed a great deal to its encouragement. Plough trials were also held and a gold medal awarded to Cuthbert Clarke in 1771 for an essay on the principles of plough construction. Although on light land improved types like the Norfolk wheel, the Suffolk swing and the Rotherham plough were in use, nothing had as yet been designed to replace the cumbersome old-fashioned plough, drawn by teams of horses or oxen, on heavy clays, like those of Kent and parts of the West country. Other implements to which the Society gave its attention included an efficient drill, a harrow, a cultivator, a horse-hoe and a mechanical reaper.[1] Both John Common, whose

1. Hudson (D.) Luckhurst (K.W.) 'The Royal Society of Arts' London 1954. pp. 71-84.

design was later successfully developed in America by John McCormick, and Patrick Bell submitted a reaping machine to the consideration of the Society but it failed to perceive the merit of their invention and made no award.(1) In the course of these activities, the Society collected a repository of implements which, as its historians Mr. Hudson and Mr. Luckhurst remark, provided a pattern for manufacture and a basis for further improvement.(2) A similar collection of new implements was built up by the Board probably with these ends in view. It included William Amos' bean drill and drill-plough, Betancourt's reaper and Small's plough, and represented a total expenditure of £493. 5. 0.

The number of claims submitted for the Board premiums is difficult to estimate. Between 1803 and 1808, a period for which the Board records are extant, only three essays appear to have been sent in on the subject of manures. Two concerned the use of salt. They were referred to Humphrey Davy for comment after which that written by Edmund Cartwright was considered worthy of the premium.(3) The other related to the correct depth of paring and burning and was written by John Boys. He was awarded the gold medal.(4) Both authors were already known to the Board. Edmund Cartwright had won the fourth prize in an essay competition organised by the Board to elicit information on the conversion of grassland to tillage in res-

1. Hudson. op.cit. p. 82.
2. ibid. p. 80.
3. Bd. Mss. Minute Book. January 22nd and 25th. 1805. p.p.490-'2.
4. ibid. March 22nd 1805. p.525.

ponse to a requisition from the House of Lords. John Boys was the author of the Kent report. During the same period only one claim was submitted for premiums on soiling and cattle diseases respectively. Presumably, since about £500 was expended in medals and honorary awards within the same period, these do not represent the total response to the Board premiums. But even so, it must have been small.

The reason for this apathy is fairly obvious. The Board premiums were designed for large farmers and country gentlemen with the wealth to indulge in expensive ventures like land reclamation or the leisure and education to carry out and record agricultural experiments. They could not have been numerous. Moreover the size of the premiums was too small to provide an incentive. Somerville had suggested awards of £50 or £100 each, but those given by the Board rarely exceeded £20 and frequently took the form of gold and silver medals. Such was Young's criticism:

> "When the chief business of the Board was confined to the annual offering of premiums, much might have been done by very few with large terms annexed; but they were frittered down to such beggarly rewards as to excite no attention. Very few were claimed, and still fewer by communications of real merit. One premium of 200 guineas would at any time have a better effect than forty or even a hundred of 15 or 20 guineas each. I have many times made this observation but it was never listened to".

Towards the end of its life, the Board's premium policy radically changed. In 1818, during the presidency of the Earl of Macclesfield they were offered for the best cultivated farm subject

1. B.M. Add Ms. 34,855. Young. 'The Elements and Practice of Agriculture'. I. p.14.

to the adjudication of the provincial societies. Seven societies claimed and received the awards, namely those of Anglesey, Cambridge, Cumberland (or Workington), Holderness, Manchester, Radnor and Sussex.(1) The Earl of Hardwicke who entered on his second Presidency the following year continued this premium. In 1819 the entry was somewhat larger. Twelve societies claimed the award, namely those of Aberdeen, Bedfordshire, Breconshire, Glamorganshire, Kendal, Manchester, Morayshire, Radnor, Staffordshire, Shropshire, Workington and Cambridgeshire. Ten received it. The reports of Radnor and Staffordshire were judged unsatisfactory.(2) He also extended this policy to livestock. In 1819, a premium was offered for the best bull exhibited in the annual cattle show of a district society. The Anglesea, Great Torrington and Workington agricultural societies claimed the award.(3) Two years later when the Earl of Macclesfield was again president of the Board he organised its first cattle show. It was held on Monday and Tuesday, the 9th and 10th of April at Aldridges Repositary in Upper Regent Street. The Marquis of Londonderry entered a ram and secured with it a premium of £10. Implement makers and seedsmen were to be admitted on payment of a guinea.(4) Had it continued to exist, it is probable that an annual show would have become an integral part of Board policy. Unfortunately it was at this juncture that the Treasury announced

1. Bd. Mss. Minute Book. May 4th and June 8th 1819 pp. 175 and 196.
2. Rough Minute Book May 2nd 1820 p.8. and May 12th 1820 pp. 14-17.
3. ibid. May 30th 1820. p.27.
4. ibid. April 3rd 1821. p.62.

its intention to withdraw the grant.

Thus although the Board implemented Somerville's proposal for a premium policy, it did not adhere to his intention. The awards which it offered were not designed for the 'plain farmer' and consequently did not establish any contact with him.

The real contribution made by the Board to agricultural improvement lay in quite a different direction. This was the countenance which it gave to agricultural science.

During the latter part of the eighteenth century experimental inquiry gradually became popular in agricultural circles. The disruption of the old pattern of cultivation, the introduction of new crops, the use of a wide variety of fertilisers and the advent of drill sowing, all raised problems which could only be solved by detailed comparative observation. So experiments began to be devised which so far as possible would isolate a single factor like gypsum as a manure, or clover as a preparation for wheat and enable its operation to be determined. Both Young and Marshall indulged in this activity. Young recorded his experiments in 'A Course of Experimental Agriculture' published in 1770 and Marshall his in 'Minutes and Observations with Experiments and Observations concerning Agriculture and the Weather' published in 1783. At the end of the century both the Durham Society and the Northumberland Society entertained the idea of a farm devoted to this purpose. Likewise, Sinclair, characteristically envisaged ten, situated in various parts

of the country and published 'Proposals for establishing by subscription a Joint Stock Tontire Company' whose purpose it should be to finance them at an estimated expense of £35,000.. In support of each plan, the necessity of replacing vague assertions by proven fact was emphasized:

> "Whoever in short considers how often in every branch of this most important of all arts we meet with unfounded prejudices or at best with plausible conjecture, may form some idea of the extensive advantages which mankind would derive from a well-constructed series of experiments in agriculture". (1)

The decision of the Board to engage in experimental inquiries was, therefore, in keeping with the current trend of interest in agricultural circles. It acquired for this purpose an acre of land at Brompton. After one year, in 1803, it was given up, but the experiments were continued until 1806. A certain Mr. Wright of Pickworth was commissioned by the Board to carry them out according to its directions. When the committee of the Northumberland society considered the use which should be made of an experimental farm, they described the chief categories of investigation as a comparative trial of implements, a comparison of the feeding qualities of different kinds of livestock, a comparison of different rotations and leys, and a comparison of different modes of waste reclamation. (2) The enquiries scheduled by the Board can be roughly divided into two groups: the effect of different methods of planting and the nature of different

1. Annals. XXXI. p.104.

2. ibid. pp. 4 - 6.

kinds of manures. In 1802 the Board ordered the preparation of several plots for a comparative study of barley, dibbled and drilled in different quantities at different intervals. Another series of plots was devoted to potatoes planted at different intervals and a third, in 1805, through the agency of Wright, to seed barley sown at different depths. Similarly, in 1802, turnips were grown on plots prepared with different quantities and kinds of manure, including dung, sea-salt, soda, lime and chalk, and in 1805 barley on land dressed with fresh and rotten dung, barley and bean straw. Two other experiments concerned the effect on plots cultivated according to the Norfolk rotation of paring and burning to different depths, and the comparative value of turnips and pulse as a means of cleaning land.(1) The results of these experiments have not been preserved save for those of 1805 which were published in the fifth volume of "Communications".(2) That of the barley experiment is most interesting. It shows an uninterrupted correspondence between increased yield and decreased depth of sowing which would be confirmed by a modern group of experimentalists who advocate surface seeding.

No contribution was, of course, made by these experiments to the existing corpus of agricultural knowledge. They were too few in number and too limited in scale to have any effect save as an

1. Bd. Mss. Minute Book. 1798-1805. March 25th 1802, p.297.
   March 16th 1804, pp.453-454.
   March 8th 1805, p.517.
2. Communications to the Board of Agriculture, 1806. vol. V Pt.I. pp. 175-180.

indication of the means which the Board recommended for further agricultural progress. But the next venture of the Board was both important and influential. This was the inauguration of an annual series of lectures by Humphrey Davy and his appointment as Professor of Agricultural Chymistry.

A growing awareness of the relevance of Chemistry to an understanding of the conditions of plant growth was another feature of agricultural theory in the late eighteenth century. In 1783 Marshall wrote:

> "While the vegetable economy remains mysterious, the theory of melioration will, of course, be hypothetical. Experience it is true may do much, but unassisted by some general principles its advances to scientific system will be slow."(1)

A similar observation was made by Young ten years later:

> "The practice of agriculture depends in almost every step upon mechanics and its principles ought to be sought for in the truths which chymistry has brought to light".(2)

No real progress could, however, be made towards an understanding of plant physiology until the composition of air and water had been determined by the investigations of Priestley and Lavoisier. Consequently although by the middle of the century these two elements appear to have been recognised as the primary sources of plant nutrition, the explanations given of their operation could not be other than fanciful.

1. Marshall. Minutes of Agriculture, 1783. p.iii.
2. Young. Annals of Agriculture, 1793. XXI. p.231.

> "In no branch of philosophy are imagination and conjecture more freely indulged in than in what concerns the food of plants", wrote Lord Kames, "Every writer erects a system: if he can give it a plausible appearance he enquires no farther".(1)

Francis Home, a Fellow of the Royal College of Physicians at Edinburgh, suggested, in 1757, that the "fructifying principle" present in air was nitrous acid. This he believed became available to plants by uniting with earthy substances in the soil to form a neutral salt.(2) Others, according to Lord Kames, believed that oil and salt attracted from the air constituted the food of plants, a theory which was apparently refuted by the experiments of Dr. Ainsley.(3) Lord Kames himself wisely refrained from attempting any detailed explanation. One of the first to apprehend in some measure the process of plant nutrition was Jan Ingenhausz, a Dutch physician. An exposition of his theory appeared in the "Annals" for 1801.. His attention was drawn to the use made by plants of air by the apparently paradoxical results of experiments conducted by Priestley and Scheele. Scheele was a Swedish chemist who, though working independently, shared with Priestley the honour of being the first to isolate oxygen. These experiments seemed to show that plants kept under similar conditions both "corrupted good air" and had "a power of correcting bad air".(4) Ingenhausz repeated them and correctly observed that whilst the flower and the roots gave off cardon-dioxide

1. Kames. The Gentleman Farmer, 1776. p.312.
2. Home (F.) 'Principles of Agriculture and Vetetation' 1757. pp. 121 and 111.
3. Kames ibid. p. 316.
4. Ingenhausz. Annals. 1801 XXXVII. p.293.

consistently, the green parts of the plant did so only in darkness.(1) From this evidence he concluded that carbon-dioxide was absorbed from the atmosphere by the decomposition of air and transformed within the plant organism into various other substances which constituted its food. "If plants imbibe fixed air or carbonic acid", he wrote, "it is not more difficult to believe that this substance may be transformed, elaborated and modified into various other substances and salts in the organs of plants, than it is difficult to believe that the above-mentioned changes take place in the human body".(2) This conclusionwas largely intuitive; a fortunate shot in the dark. Ingenhousz was so far from understanding the details of the process as to regard the emission of carbon-dioxide rather than oxygen as evidence that it was taking place. "From this doctrine", he wrote, "it would naturally be inferred, that plants grow most rapidly at such time when they prepare the greatest quantity of this nourishment which is when they are in the dark".(3) Nevertheless, his basic thesis that carbon-dioxide was a source of plant food from which other essential substances were derived, was essentially correct, and foreshadowing as it does the theory of photosynthesis, constituted a substantial contribution to vegetable physiology.(4)

1. Ingenhausz. op.cit. pp.294-'5.
2. ibid. p. 298.
3. ibid. p. 304.
4. Lambert (E.W.). M.Sc. Thesis. London 1937.

"The Contributions of Priestley, Ingen-Housz, Senebier and N.T. de Saussure to our knowledge of photosynthesis and respiration."

The engagement of Humphrey Davy by the Board in May 1803 for a course of lectures on agricultural chemistry was, therefore, made at a propitious moment. Agricultural theory was just beginning to be translated from the realm of speculation to that of science. The appropriate resolutionwas taken at a Board meeting attended by Lord Sheffield (then President), Sinclair, George Fordyce (later Baron Oriel) and Sir George Paul. Permission to employ Davy was obtained from the Manager of the Royal Institution by Sir Joseph Banks. The use of the lecture room was also offered 'whenever it shall not be wanted for the regular lectures of the Institution, provided subscribers or persons coming with the tickets of proprietors be allowed admission'. But perhaps from an unwillingness to comply with this condition the Board decided to use its own premises.(1) The lectures, six in number, were delivered on Tuesdays and Fridays at 12 o'clock during the month of May 1803.(2) On both these days members normally met for Board and Committee meetings and could therefore attend without additional inconvenience. Unfortunately the size of the audience is not recorded but it was probably large. The event was well publicised, - five hundred prospectuses were ordered to be printed for the use of members,(3) - and Davy, although only twenty-five, had already won a reputation among the cultured élite for eloquence and brilliance.

1. Bd. Mss. Minute Book, 1798-1805. May 25th, p.327 and June 2nd 1802, p.334 and April 29th and May 3rd 1803.
2. ibid. April 29th 1803, p.413.
3. ibid. May 3rd 1803. p.415.

In accordance with the terms of his engagement, Davy gave, in these lectures, a comprehensive survey of existing knowledge about the principles of vegetation. The first was introductory and designed to acquaint his audience with the broad categories into which agricultural science could be divided; namely plant physiology, plant nutrition and soil fertility. These he treated separately and in greater detail in four of the lectures which followed. One was devoted to an exposition of the chemical changes involved in germination and growth; another to air and water as agents of plant nutrition. The other two dealt respectively with the composition of soils and the properties of different manures.(1)

The account given by Davy of plant nutrition in his original course of lectures to the Board survives unfortunately only in the form of a brief outline which is probably identical with the prospectus circulated to members. He describes the process in terms of gases, principally hydrogen and carbon dioxide, which, he explains, "there is great reason to suppose - are procured (at least in part) from the decomposition of water and carbonic acid".(2) This statement is amplified in Davy's "Elements of Agricultural Chemistry", a work comprising the substance of lectures which he gave to the Board between 1803 and 1810 as their Professor of Agricultural Chemistry. It was published in 1813 by which time the theory of

1. Outlines of a Course of Lectures on the Chemistry of Agriculture to be delivered before the Board of Agriculture, 1803.
2. Davy. ibid. p.6.

photosynthesis had apparently been clarified:

> "The germination of seeds does not take place" - he wrote - "without the presence of air or oxygen gas and in the sunshine vegetables decompose the carbonic acid gas of the atmosphere, the carbon of which is absorbed and becomes a part of their organised matter, and theoxygen gas, the other constituent is given off". (1)

Of the component parts of soils, Davy had at first little to say. He merely reaffirmed in technical language the distinctions already drawn by observant farmers between stiff clays and sandy loams. It was not until after his researches into the composition of the alkalis, that he was able to define more closely the chemical constituents of various mineral and saline compounds whichwere known to be present in soils and occasionally used as fertilisers. Nonetheless, the Board committee recorded its satisfaction with these lectures and it was resolved to appoint Davy Professor of Agricultural Chemistry at an annual salary of £100. In this capacity he was expected to deliver an annual course of lectures, and to analyse substances sent in by Board members.

> "They may, however, after the encouragement they have given to science, be fairly allowed to hope that it will not be long before Mr. Davy, with proper assistants under his superintendence, will be able to undertake the business of analysing soils, manure, etc., for individuals wishing to consult him at a moderate fixed price". (2)

It was intended to fit up a laboratory for this purpose at a maximum cost of £100 but there is no evidence of any larger sum than £8.17.6., being spent on chemical apparatus. A few analyses were, however,

1. Davy. Elements of Agricultural Chemistry, 1813. p.14.
2. Bd. Mss. Minute Book 1798-1805. May 27th 1803. p.428.

carried out. Of these guano is of greatest interest. It is a substance, composed of the excrement of sea birds, which though extensively used in the mid-nineteenth century, was little known at the time of the Board. Prothero says it was first imported into England in 1835.(1) The Board acquired samples from South America for analysis by Davy. He described it as a compound of ammonical salts ammounting to a third of its content, carbon, oil and other salts. To-day, some types of guano are known to contain a nitrogen compound of eleven per cent. Ammonia is a compound of nitrogen and hydrogen.

The annual course of lectures was continued until 1812, save for the year 1807 to 1808 when the attendance was considered too small to justify their delivery.

These lectures were undoubtedly a valuable contribution to agricultural theory. They were the first of their kind to be delivered. Had Davy not held the Board appointment he might never have turned his attention to these matters. But equally, if not more important than the specific services he had rendered, was the countenance given by the Board in this way, to the union of agriculture and chemistry. Hitherto theories about the nature of soils and the growth of plants had been so speculative as rightly to command little respect. By commissioning Davy to lecture on these subjects the Board secured for them the position of an accepted branch of scientific knowledge.

1. Prothero 'English Farming Past and Present' 1927. p.366.

Its example was quickly followed by the Bath Society. At the annual meeting of 1805, they approved the suggestion of Sir John Coxe Hippersley, a Vice-President, that a laboratory should be equipped. A subscription for this purpose was launched and a committee of chemical research set up. The following year, a course of lectures on chemistry was gratuitously delivered by Dr. Clement Archer. Their continuance was prevented by his death. A chemist named Boyd was also employed to analyse soils and limestones in the neighbourhood. His results were published in the Bath papers.(1)

In conclusion, Somerville failed to turn the attention of the Board to practical, if humble, objects. His proposals were not implemented. Hence the Board failed to exercise any direct influence on the practice of the ordinary farmer. Its contribution to agricultural progress was, therefore, primarily theoretical. It emphasized the relevance of chemical knowledge and the experimental method to the development of a science of agriculture and for the first time made available to the public a complete, if imperfect, picture of farming throughout the kingdom.

1. Bath Paper. XI. 1805. pp.xiv-xvi.

CHAPTER 7

CONCLUSION

The Board came to an end in 1822 as a direct result of the withdrawal of the Parliamentary grant two years earlier. In October 1820, the Treasury notified the Board that they did not feel themselves justified in recommending its continuance.(1)

There were ample grounds for this decision. Since the cessation of Davy's lectures in 1812 and the conclusion of the County Reports in 1814, there had been no projects, and with the exception of "The Agricultural State of the Kingdom" no publications. The activities of the Board dwindled to the offer of a few simple premiums for the best farm or the best livestock whose adjudication was even left to the provincial societies. But as if to emphasize its lack of vitality the Board, in 1819, informed the Chancellor of the Exchequer that "it is not the wish of the Board of Agriculture to apply for a larger sum than £1,000 for the service of this year, the existing state of the funds enabling the Board to defray the expenses to which it is expected to be liable during the present year".(2) It is not surprising the grant was discontinued.

Furthermore, relations between the Government and the Landed Interest at this time were not such as to predispose the former favourably towards the Board of Agriculture. In 1819 the first

1. Md. Mss. Rough Minute Book. 1820-'22. pp.46-47. February 2nd.1821.
2. ibid. April 2nd 1819.

petitions for a still further increase in corn protection were laid before the House. A section of the agricultural interest had always maintained that the 80/- price level of the 1815 act did not allow the farmer to recover in years of high prices, the losses sustained when markets were low. Of this section the chief exponent was George Webb Hall who succeeded Young as Secretary of the Board of Agriculture. His proposals for a higher import price level or a fixed duty of 30/- qr. were not calculated to commend themselves to a Government which, in Lord Liverpool's words, had supported the 1815 Bill only "with a view of preventing that convulsion of landed property, which a change from such a war to such a place might otherwise produce".(1)

In 1819 also, Peel's Bill, which provided for a resumption of cash payments after May 21st 1823, was passed. At the time of the grant's withdrawal this measure had not been singled out for attack by the Landed Interest as the major cause of the prevailing distress. But Sinclair was already numbered among its critics, and Sinclair, whether he attended or not, was inevitably associated withthe Board. When in 1810, the report of the Bullion Committee was published, he observed that a reduction of the circulating medium, consequent upon the resumption of cash payments would adversely affect the landed and farming interest:

1. Speech of the Rt. Hon. the Earl of Liverpool. May 26th 1820. p. 21 - 22.

> "They are at present ennabled to go on notwithstanding the increased expense of cultivation and the pressure of heavy taxes in consequence of the additional prices which their commodities fetch, and the facility with which they obtain payment, owing to the abundance of a circulating medium; but if the taxes remain as they are, and if, in consequence of the diminution of the circulating medium, their commodities should become unsaleable except at low prices, and with the payments either distant of uncertain, the agricultural interest would be undone". (1)

In a pamphlet prompted by the distress which followed the conclusion of the war, Sinclair described more precisely the ruin which he reckoned the reversion to a metallic currency would bring down upon the agricultural community. On the one hand, it would occasion 'a revolution of landed property greater than in France', since the landlord and farmer could not possibly repay in coin the sums he had borrowed in inflated paper money. On the other, without a proportionate rise in price levels, it would bring the landed and commercial classes into conflict. Incidentally, it would immediately curtail improvement and render the land incapable of supporting the weight of taxation imposed upon it:

> "The land cannot bear its present burden if the circulating medium is diminished and if the price of produce remains at its present rate a struggle must arise between the landed and monied interests for existence: either the one or the other must give way. Anxiously do I wish to avert a struggle that would prove fatal". (2)

According to Barnes, these arguments had, by 1823, replaced those of increasing costs and heavier taxes as the prime justification for yet

1. Sinclair. Observations on the Report of the Bullion Committee London 1810. pp. 49-50.
2. Sinclair. Thoughts on the Agricultural and Financial state of the Country. London 1815. p.9.

higher import price levels. The concurrence of agricultural distress with the first measures for the resumption of cash payments probably suggested a causal connection between the two, but it may be that Sinclair, through his pen, influenced to some extent the formation of agricultural opinion. With this opinion, the government in this instance, showed a complete lack of sympathy. Lord Liverpool maintained that the depreciation of the currency in 1819 when the Bank Committees were sitting, and presumably, therefore, the affect on prices of the revision to a metallic currency, was not more than four per cent, and that the agricultural distress must be attributed to want of a market which it was beyond the power of Parliament to create.(1)

Meanwhile the Board, deprived of public support, had ceased to be. At first, it had attempted like other private societies to exist on voluntary subscriptions. A circular letter was sent to every member requesting an annual subscription of two guineas or a life subscription of twenty guineas for the maintenance of the Board. The response to this letter was reported to be so satisfactory as "to place the existence of the Board beyond all hazard".(2) This forecast would seem to have been a little previous for in just over a year, after petitioning the Treasury in vain for a renewal of the grant, the Board decided it could no longer continue its activities unassisted by public money.(3) It constitutes a most unfavourable

1. Speech of the Rt. Hon. the Earl of Liverpool. 1822. p. 25 and pp. 38-9.
2. Bd. Mss. Rough Minute Book May 25th 1821. p. 84.
3. ibid. June 7th 1822. p.130.

commentary on the success of the Board's career. Of course its expenses were greater and its membership more restricted than those of other societies. But these were difficulties which could be overcome. To some extent the Board attempted to do so. It resolved to open its honorary membership to anyone who could produce a certificate signed by two Board members and ordered the Secretary to publish these new terms of admission in the 'Courier', the 'Farmers' Journal' and the 'County Chronicle'.(1) The result was poor. The total sum received by the Board, which included the subscriptions of existing members, in the course of a whole year was £241. 10. 0.(2) Within two days, in 1838, the newly founded English Agricultural Society attracted by similar means subscriptions amounting to £2,500.(3)

This final failure supports the impression obtained from the minutes, that the Board never formed any strong connection with the English farming community. The objects for which it offered premiums were either too theoretical or too extensive to attract the ordinary farmer. The idea of an annual show or agricultural meeting suggested by both Somerville in 1799 and Sinclair in 1806 did not materialise until the closing years of the Board's existence. The field experiments begun at Brompton were too limited in scale

1. op.cit. May 25th 1821. p.84.
2. ibid. May 24th 1821. p. 128.
3. Watson (J.A.S.) History of the Royal Agricultural Society. 1939. p. 19.

and too short lived to be of any use. Accordingly the Board did little either to promote piecemeal improvement or to assist the elucidation of technical problems like the principles of plough construction or the reason for the deleterious effect on the land of the traditional turnip husbandry in some parts of Norfolk. Likewise, it was left to the Society of Arts to make the first authoritative pronouncement in favour of drill husbandry.

Two explanations for the Board's inability to frame a definte policy or pursue one object for any length of time suggest themselves. The first is financial. For many years the county surveys constituted a drain on its resources which hampered any new major undertaking. The second arises from the uncertainty which throughout its career surrounded the character of the Board. As a consequence of its public establishment, its attention was continually distracted by more general issues connected with the capacity of agriculture to feed the augmented population and the conditions necessary to encourage the expansion of its productive resources. Thus in 1795 and 1796 its energies were almost wholly engaged in efforts to promote extended cultivation by the reclamation of waste land. To this end the General Enclosure Bill and the attempt to publicise Elkington's draining technique were alike directed. In 1800 and 1801 the requisition from the Lords Committee on the High Price of Provisions concerning the advisability of permitting tenants to break up grassland, and from the Commons Committee on Scarcity concerning the desirability of premiums to encourage the

cultivation of early potatoes took up much of its time.(1) The advice finally offered to their Lordships against such a measure was based on the experience of numberous farmers as expressed in essays entered for a competition organised by the Board on an extensive scale. At the same time they were endeavouring to obtain from correspondents an estimate of the acreage under cultivation and its expected yield. In 1804, the Board was twice consulted by Select Committees of the Commons. One on the Corn Trade asked for information "respecting the rates of labour and various charges on arable farms in 1790 and in the present year".(2) The other on Scotch Barley and Malt ordered Arthur Young as Secretary to the Board of Agriculture to appear and lay before the Committee an account of the seed-time and harvest of barley in England for purposes of comparison with that of Scotland.(3) Four years later the Board furnished the Select Committee on Roads and Wheel Carriages, which was set up at its request, with the results of investigations into Cumming's wheels with cylindrical hubs.(4) In 1814, it was again asked for information concerning the costs of arable cultivation, this time by the Lords' Committee on the Corn Law.(5) Finally, in 1817, a year of agricultural depression, the Board made one further enquiry into farming costs, particularly in terms of rent, wages poor-rates taxes and tithe.(6)

1. Bd. Mss. Minute Book December 9th and 17th 1800 and June 19th 1801.
2. ibid. 24th April 1804.
3. ibid. May 4th 1804.
4. H.C.1806. (321) II. 249.
5. H.C. 1814-'15 (26) V.
6. The Agricultural State of the Kingdom, 1817.

Of these requests for information by Parliament, all but two came from committees whose chairman was a Board member. Lord Carrington presided over the 1801 committee of the Lords on the Dearth of Provisions, Sinclair over the Select Committee of the Commons on Scotch Barley in 1804 and Roads and Wheel Carriages in 1808 and Hardwicke over the Lords' Committee of 1814 on the Corn Laws. They indicate, therefore, the conception entertained by the Board itself of its status and function as a public office of intelligence rather than any real recognition of it as such in political circles. For this tendency to magnify the position of the Board, Sinclair was primarily responsible. He envisaged it as the nerve-centre of the agricultural industry and its link with the administration. Even as late as 1810 he could refer to agriculture as "that great department over which it (the Board) presides".(1) But this conception had no basis in fact. This was made abundantly clear when during the scarcity of 1800-1801, the Administration consulted the Board on only one minor matter, the claim of a man named Davis to have found a method of cleaning smutty wheat,(2) and entrusted to the Home Office the enquiry about the acreage under different crops. Likewise the defeat of the General Enclosure Bill and its attendant circumstances made it quite clear that the Board was not expected to promote the interests of farmers and landowners in the political arena.

1. Sinclair. Address to the Board of Agriculture 1810.
2. Bd. Mss. Letter Book June 28th 1800. The Board to Mr. Davis.

Devoid, therefore, of any connection with the administration but inclined to regard itself as a public office, generally concerned with any issue which directly affected agriculture, the Board tended to become an organ of the landed interest. So far as it had a policy, it was the promotion of capitalist farming. Cheaper and easier enclosure, tithe commutation, lighter poor-rates, deep-drainage and scientific farming, objects to which the Board devoted much of its attention mattered a great deal to those farmers and land-owners who were financially able to take advantage of the high prices occasioned by war conditions. In the struggle for corn protection the Board took no direct part but several of its members were actively engaged, and it provided the evidence of increased costs on which the claim for higher import price levels was based. It is probably, therefore, not entirely a coincidence that the Board lost its annual grant when the landed interest befan to lose favour. Significantly neither of the two national agricultural institutions established during the nineteenth century concerned themselves with political issues. The Royal Agricultural Society, at the outset, specifically excluded politics from their discussions and their activities,[1] whilst the present Ministry of Agriculture originated in a committee of the Privy Council set up in 1866 to deal with the prevention of cattle-plague.

In conclusion the history of the Board is the history of an institution whose intended purpose was at variance with its actual

1. Watson (J.A.S.) The History of the Royal Agricultural Society. London. 1939. p.15.

powers and the economic climate in which it existed. It never came to regard itself as an ordinary agricultural society and i t never attained to any official position. Consequently its only real contribution to agricultural progress was the emphasis it placed on agricultural science and its only concrete achievement the series of county reports which remain a lasting memorial to the statistical aspirations of its founder.

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These are not exact copies of the rough minute books which in the early years of the Board also contained minutes of Committees on Expenditure.

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Maidstone 1781.
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Appendix I

LIST OF THE PRESIDENTS OF THE BOARD

1793 to 1798 1806 to 1813

The Right Hon. Sir John Sinclair, Bart. (1754-1835)

1798 to 1800

John Southey Somerville, 15th Lord Somerville (1765-1819)

1800 to 1803

Robert Smith, 1st Lord Carrington (1752-1838)

1803 to 1806

John Baker Holroyd, 1st Earl of Sheffield (1735-1821)

1813 to 1816 1819 to 1821

Philip Yorke, 3rd Earl of Hardwicke, K.G. (1757-1834)

1816 to 1819 1821 to 1822

George Parker, 4th Earl of Macclesfield (1755-1842)

1793 to 1820

Arthur Young. Secretary to the Board (1741-1820)

APPENDIX 2

List of Charter Members

Augustus Henry Fitzroy. 3rd Duke of Grafton. 1735-1811.

Although his Memoirs deal only with his political career he indulged an interest in agriculture on his Northamptonshire estates. In May, 1796, the Board wrote asking him to assist the Staffordshire reporter William Pitt with information about the County's agriculture. He was a friend of Arthur Young and also of Richard Watson, Bishop of Llandaff, another Charter member of the Board whose religious tracts he admired.

Francis 5th Duke of Bedford. 1765-1802.

In addition to his membership of the Board, he belonged to the Smithfield Club, of which he was first president, the Bath Society and the Bedford Agricultural Society which he helped to found in 1801.

Henry Scott. 3rd Duke of Buccleuch. 1740-1812.

Ld. Lieutenant of Midlothian and Roxburgh, 1804. He was one of the greatest landowners in the United Kingdom. The total extent of his estates amounted to 460,000 acres.

Thomas Thynne: Marquis of Bath. 1734-1796.

He apparently maintained some connection with the Bath Society since his name is mentioned in the premium lists with reference to experiments in sheep-breeding. His land-agent Thomas Davis wrote the Board report on Wiltshire.

George Finch. 9th Earl of Winchelsea. 1752-1826.

Lord Lieutenant of Rutland.

Winchelsea is chiefly remembered for his advocacy of cow-closes as a solution to the rural problem of depopulation and poverty. On his own estates he claimed this policy had prevented the enormous increases in poor rates that had occurred elsewhere.

James Hope. Earl of Hopetoun.

Lord Lieutenant of Linlithgow.

He owned extensive estates in the county of Linlithgow. Like Sinclair he was a member and for some time vice-President of the Highland Society. He was also associated with Sinclair in the formation of the British Wool Society.

William Wentworth. Earl Fitzwilliam. 1748-1833.

Lord Lieutenant of the West Riding.

George O'Brien Wyndham. 3rd Earl of Egremont. 1751-1838.

Lord Lieutenant of Sussex. 1751-1838.

The Earl of Egremont was a Sussex landowner of great wealth which he devoted to the promotion of Art and Agriculture. He made Petworth House, says one authority "a nursery of art and a college of agriculture". Turner enjoyed his patronage and Arthur Young his friendship. As an agriculturalist, Egremont was chiefly interested in stock breeding. He was for some years President of The Sussex Society, and in this capacity supervised arrangements for the annual cattle show. On his estates he adopted a similar policy to that of Winchelsea for the prevention of rural distress. To each cottage he attached a small allotment or garden.

Sir James Lowther. Earl of Lonsdale. 1736-1802.

Lord Lieutenant of Westmorland. 1758.

" " " Cumberland. 1759.

Francis Rawdon Hastings. Earl of Moira. 1754-1826.

He was a parliamentary acquaintance of Sinclair's.

John Joshua Proby. Earl of Carysfort.

M.P. for Stamford. 1790-1801.

Richard Watson. Bishop of Llandaff. 1737-1816.

He was appointed to the Chair of Chemistry at Cambridge University in 1764 and to that of Divinity in 1771. In 1782 he became Bishop of Llandaff. After his retirement from Cambridge he lived in Westmorland. There he turned his energies to the improvement of waste-land. In 1805 he obtained a premium from The Society of Arts and in 1808, the Gold Medal of the Board for papers on this subject. He frequently attended Board meetings.

Martin Bladen. Lord Hawke. 1744-1805.

Son of Admiral Hawke: victor of Quiberon Bay.

Sinclair consulted Lord Hawke about his proposed Board shortly before its establishment. Hawke gave it his qualified approval. It could, he considered, be of value provided it devoted its attention not to experimental inquiry but the promotion of greater efficiency in the performance of agricultural operations. He also thought it might prove advantageous in advancing the claims of agriculture to state encouragement. "Another great advantage would be derived from your plan: Government would be able to ascertain and draw a line between agriculture and manufactures. By giving

too great an encouragement to the latter, the loss of hands is very often severely felt by the former". None the less he at first declined belonging to the intended institution.

Lord Clive. 1754-1839.

Lord Lieutenant of Salop. 1775-1798 and 1804-1809.

" " " Montgomery. 1804-1830.

M.P. for Ludlow. 1774-1794.

John Baker Holroyd. Lord Sheffield 1735-1821.

President of the Board 1803-1806.

Sheffield's family estates were in Ireland but he chose to reside at Sheffield Place in Sussex which he purchased from Lord de la Warr for £31,000. It became a model of enlightened husbandry. In addition to membership of the Board, he also belonged to The Sussex Society. He was a prominent member of the protectionist interest in the House of Commons. Not only did he advocate higher grain tariffs but also the imposition of 1/- in duty on every pound of imported wool as a necessary stimulus to the production of fine-wool within the country. The improvement and propagation of fine-wool breeds particularly interested him. In 1793, he associated with Sinclair in the British Wool Society. Also Gibbon's executor.

Rt. Hon. William Windham.

M.P. for Norwich in 1793.

Windham was a political associate of Sinclair's at the time of the Board's establishment. This seems to be the only reason for his inclusion among the Charter Members. He was reluctant to accept the appointment. "I can hardly reckon myself among the genuine supports of the plan that

has produced this institution", he wrote to Sir John. "I am doubly bound therefore while my principles are so unsettled to decline a situation my appearance in whibh, from my complete incompetence, could only be accounted for by the supposition of extraordinary zeal". His membership terminated in 1796.

Sir Charles Morgan. 1760-1846.

MP for Brecon. 1787-1796.

" " Monmouthshire. 1796-1831.

Sir Charles was noted for his encouragement of agricultural improvement in Brecon and Monmouth. He erected a cattle market at Newport.

William Pulteney.

M.P. for Shrewsbury in 1793.

Thomas William Coke. 1752-1842.

M.P. for Norfolk. 1776-1784, and 1790-1806, and 1807-1832.

In addition to membership of the Board Coke belonged to the Manchester and Norfolk Society. Sinclair was particularly anxious he should be present at the initial meeting of the Board. In a letter to Young written just before its establishment he said, "I wish you could bring Mr. Coke with you, who is to be a member of the Board and who I wish to attend the first meeting". So far as can be ascertained from the extant minute books, Coke attended the Board infrequently, but, save for an interval from 1798-1799 and 1800 to 1804 he retained his membership until at least 1809 when the Board membership records cease.

Henry Duncombe.

M.P. for Yorkshire in 1793.

He supported the motion for an Address to the Crown during the Commons' debate on the establishment of the Board.

Edward Loveden Loveden.

M.P. Abingdon, Berks. 1784-1796.

M.P. Shaftesbury, Dorset. 1802-1812.

Loveden was a country gentleman of considerable wealth who lived at Buscot Park in Berkshire. Marshall described him as "a zealous and veteran amateur of the rural science". Within the county he was distinguished for the number and variety of his implements and his breed of Hereford cattle. In 1800 he helped to re-establish the Berkshire agricultural society. He was an assiduous Board member.

John Southey. 5th Baron Somerville. 1765-1819.

President of the Board 1798-1800.

Sinclair records that he included Somerville among the original members of the Board in response to his personal request. Somerville was a great friend of the Duke of Bedford. "His favourite study" says Sinclair "was stock". Besides being President of the Board, he took a prominent part in several other agricultural institutions. From 1798-1799 he was president of the Bath Society, and from 1804-1814 vice-president of the Smithfield Club of which he was a foundation member. He was also for some time president of The Wyveliscombe Society.

Robert Smith (Ld. Carrington). 1752-1838.

President of the Board, 1800-1803.

M.P. for Nottingham 1789-1797.

Carrington was a personal friend of Pitt. He was raised to the English Peerage in 1797.

George Sumner.

He belonged to the Surrey Gentry.

His home was at Hatchlands Park.

In 1790 he was elected M.P. for Guildford.

Several times in the 19th century his family held one of the Parliamentary seats for the county of Surrey.

John Conyers

He seems to have belonged to the country gentry of Essex.

Christopher Willoughby.

He appears to have belonged to the Oxfordshire gentry as he was asked by the Board to assist with the corrected report of that county.

William Geary.

M.P. for Kent 1796-1807.

He possessed estates in Surrey which he sold in 1804 on inheriting others in Kent.

Thomas Powys (Lord Lilford). 1743-1800.

M.P. Northampton in 1793.

APPENDIX 3

LIST OF BOARD MEMBERS, 1794-1809

(There are no entries after 1809 in the Register of Board Members)

	Ordinary Members newly elected
1794.	John Campbell, 5th Duke of Argyll.
	He was first president of The Highland Society founded in 1784.
	John Jeffries Platt, Earl Camden.
	Hugh Earl Fortescue.
	John Crewe - later Baron Crewe
	He was an enlightened agriculturist
	Sir Henry Fletcher.
1795.	Philip Yorke, 3rd Earl of Hardwicke.
	President of the Board 1814-'16 and 1819-'21.
	He was keenly interested in farming and presided over The Cambridgeshire Agricultural Society.
	Henry Dundas, Lord Viscount Melville.
	Sir W. W. Wynn.
1796.	William Wilberforce.

	Ordinary Members newly elected
1797.	Lord Viscount Newark.
	Lord Rancliffe.
	Sir Peter Burrell, Lord Gwydir.
	Sir John Call.
	Sir H. G. Calthorpe.
1798.	Lord Muncaster.
	Sir John Honeywood. - He belonged to the Kentish squirearchy.
	Richard Ellison.
	Colonel Graham.
	William Lygon, later Earl Beauchamp.
	Langford Millington.
1799.	Lord Viscount Wentworth.
	Thomas Powys, Lord Lilford.
	Colonel E. Estcourt. He was probably the son of Matthew Estcourt who possessed considerable estates, and influence in Gloucestershire and Wiltshire.
1800	Francis Bassett, Lord de Dunstanville. He was the author of several articles printed in the Annals of Agriculture.
	Sir R. W. Vaughan.
	Rt. Hon. Thomas Pelham.
	Henry Vavasour.

	Ordinary Members newly elected
1800	John Fane. - He was an Oxfordshire landowner and keenly interested in agricultural improvement.
1801	John Bligh, Earl of Darnley. Sir G. Paul. - He is best known for his work as a Gloucestershire magistrate. J. Sarjent.
1802	John Stewart, Earl of Galloway. Sir Cecil Wray. Rt. Hon. John Foster, later Baron Oriel. Rev. H. Bate-Dudley.
1803	John, 6th Duke of Bedford. - He was like his brother a keen agriculturist. For some time he was president of the Smithfield Club and in 1838 helped to found the English Agricultural Society of which he was one of the first vice-presidents. Rt. Hon. William Pitt.
1804	John Howard, Earl of Suffolk. Thomas Tyrwhitt.
1805	William Montagu, 5th Duke of Manchester. William Keppel, Earl of Albermarle. Sir H. P. St. John Mildmay. Hon. George Villiers. Charles C. Western. He was a member of the Select Committee of the House of Commons on petitions relating to the Corn Law and took an active part in the proceedings connected with the 1815 Act.

Ordinary Members newly elected

1806. John William Egerton, Earl ofBridgewater.
Thomas Pelham, Earl of Chichester.
Lord Penrhyn.
M. Burgoyne.
Charles Duncombe.

1807. George Stewart, Earl of Galloway.
Francis Seymour Conway, Lord Beauchamp.
Colonel Beaumont.
Daniel Giles.

1808. George Parker, 4th Earl of Macclesfield. President of the Board 1816-1819, and 1821-1822.
Benjamin Hobhouse. - He was president of the Bath and West of England Society from 1805-1817.
W. S. Stanhope.

1809. Sir J. T. Stanley.
Rt. Hon. Isaac Corry.
Admiral Bentinck.
Davies Giddy - (later Gilbert). - He owned estates in Cornwall and Sussex. On the Pevensey levels of his Sussex estates, he carried out extensive improvements. He was a member of the Linnean Society and in 1814 helped to found the Geological Society of Cornwall of which he was for a

	Ordinary Members newly elected
1809	time president. From 1827-1830 he was president of The Royal Society.

APPENDIX 4

Tabulated information about the preparation, publication and cost of the County Reports

Compiled from Board Manuscripts and Marshall's Review of the County Reports

England

County	General Views	1794			Corrected Reports				
	Surveyor	Profession	Cost	cost	Date	Surveyor	Profession	Cost	
			surveying	printing				surveying	printing
Bedford	Thos. Stone	Land Surveyor	-	-	1808	Thos. Batchelor	-	£200	
Berkshire	Wm. Pearce	Estate Agent	-	-	1809	Wm. Mavor		£200	
Buckingham	Jacob Malcolm, and William James		£70	-	1810	Rev. St. John Priest (incorporating an earlier survey by Richard Parkinson completed by 1806, £150)	Clergyman	£200	
Cambridge	Charles Vancouver		£125	£5	1813	Scott (£20) corrected by Rev. William Gooch.	Clergyman	£200	

County	General Views 1794				Corrected Reports				
	Surveyor	Profession	Cost		Date	Surveyor	Profession	Cost	
			surveying	printing				surveying	printing
Cheshire	Thos. Wedge		£80		1800	Fenna (no evidence of publication)			
					1808	Henry Holland		£200	
Cornwall	Robert Fraser				1811	G.B. Worgan (report revised and prepared for publication by Rbt. Walker, Jeremiah Trist, C.V. Penrose)		£200	
Cumberland and Westmoreland	John Bailey & George Culley				1805	John Bailey George Culley			
Derbyshire	Thomas Brown		£50½		1806	Curtis (no evidence of publication)		£140	

County	General Views	1794			Corrected Reports				
	Surveyor	Profession	Cost		Date	Surveyor	Profession	Cost	
			surv-eying	prin-ting				surv-eying	prin-ting
Derbyshire					1815	John Farey	Mineral Surveyor	£450	
Devon	Robt. Fraser		£100		1808	Hawkins (no evidence of public-ation)		£40	
						Charles Vancouver		£549 2s.6d.	
Dorset	John Claridge	Estate Agent	£100			Parkinson (no evidence of publica-tion)		£250	
					1812	Batchelor Stevenson (incorpora-ting Batche-lor's report)		£200 £100	
Durham	Joseph Grainger	Land Surveyor	£40	£10	1810 1813	John Bailey		£100	
Essex	Chas. Vancouver (pubd.1795)				1807	Howlett (no evidence of publication)		£100	
	Griggs				1807	Arthur Young		£200	
Gloucester	George Turner	Farmer			1807	Thomas Rudge		£150	£209 3s. 4d.
Guernsey & Jersey					1814	Quayle		£200	

County	General Views 1794				Corrected Reports				
	Surveyor	Profession	Cost		Date	Surveyor	Profession	Cost	
			surveying	printing				surveying	printing
Hampshire	Abraham & William Driver				1810	Charles Vancouver			
Isle of Wight	Rev. Richard Warner	Clergyman	£10		1807	Bell (no evid. of publication)		£100	
Hereford	John Clark		£80		1813	John Duncumb		£100	
Hertfordshire	D. Walker		£30		1804	Arthur Young		£100	£127 13s. 4d.
Huntingdon	G. Maxwell Thos. Stone Scott		£20	printed 1793 printed 1793	1811	Richard Parkinson		£150	
Kent	John Boys	Farmer			1796 1805	John Boys			
Lancashire	John Holt		£87 17s. 6d.		1795 1815	John Holt R.W. Dickson £300 ‡ Revised and prepared for press by Wm. Stevenson		£70	
Leicester	John Monk		£60		1809	Wm. Pitt		£410*	

* Including payment for Northants & Worcester corrected reports.
‡ Including £200 jointly for Lancs. and Warwick.

County	General Views 1794.				Corrected Reports				
	Surveyor	Profession	Cost		Date	Surveyor	Profession	Cost	
			surveying	printing				surveying	printing
Lincoln	Thos. Stone	Land Surveyor			1799	Arthur Young		£50	£2. 5s. 0d.
Isle of Man	Basil Quayle				1812	Thomas Quayle		£200	
Middlesex	Thomas Baird Peter Foot	Land Surveyor	£70	printed 1793	1798 1813	John Middleton 2nd. ed.	Land Surveyor	£373	£250
Norfolk	Nathaniel Kent	Estate Agent		£243 5s.3d.	1804	Arthur Young		£100	
Northants	James Donaldson		£120		1809	William Pitt		*	
Northumberland	John Bailey Geo. Culley	Land Steward Farmer			1805 (3rd ed)	John Bailey Geo. Culley		£125	
Notts	Robt. Lowe				1798	Robert Lowe			
Oxford	Richd. Davis		£87 2s.6d.		1813	Arthur Young		£200	
Rutland	John Crutchley				pub. with Leic. Rep. 1809	Richard Parkinson	Agric. Writer	£100	
Salop	J. Bishton				1803	Archdeacon Joseph Plymley	Clergyman	£100	£187 18s. 7d.

County	General Views 1794.				Corrected Reports				
	Surveyor	Profession	Cost		Date	Surveyor	Profession	Cost	
			surveying	printing				surveying	printing
Somerset	John Billingsley	Farmer	£26. 13s.	£140	1797	John Billingsley			
Staffs.	Wm. Pitt				1796 1808 (2nd ed.)	Wm. Pitt		£100	

* Including payment for Northants and Worcester corrected reports.

County	General Views 1794				Corrected Reports				
	Surveyor	Profession	Cost surveying	Cost printing	Date	Surveyor	Profession	Cost surveying	Cost printing
Suffolk	A. Young		£47.10.		1797 1804 (3rd ed)	A. Young		£80.11. 8d. **	
Surrey	William James and Jacob Malcolm	Nurserymen	£70		 1813	Dillon (no evid. of publication) Wm.Stevenson		£20 £200	
Sussex	Rev. A Young				1808	Rev. A. Young		**	
Warwick	John Wedge	Estate Agent	£80		 1813	Dickson (no evid. of printing) Adam Murray	Land Surveyor and Estate Agt.	/ £200	
Wiltshire	Thomas Davis	Land Steward	£87.2. 6d.		1813	Thomas Davis	Land Steward	£200	
Worcester	William Thomas Pomeroy				 1813	D.I.Naish (no evid. of printing) William Pitt		 *	
Yorkshire E. Riding	Isaac Leatham	Land Valuer			1812	H.E.Strickland		£250	

-** including payment for Sussex.

County	General Views 1794.				Corrected Reports				
	Surveyor	Profession	Cost		Date	Surveyor	Profession	Cost	
			Surveying	printing				Surve-ing	print-ing
Yorkshire W.Riding	John Tuke	Land surve-yor and estate agent			1800	John Tuke	Land sur-veyor and estate agent	£61	
Yorkshire W. Riding	George Rennie, Robert Brown, John Shirreff				1799	Robert Brown (earlier report with ad-ditions)			

WALES

County	1794 General Views		Corrected Reports			
	Surveyor	Cost Surveying	Date	Surveyor	Cost Surveying	Cost Printing
Brecknock	John Clark					
Carmarthen	Charles Hassall					
Glamorgan	John Fox prtd. 1796	£30				
Monmouth	John Fox	£10	1812	Charles Hassall	£280	£35
Pembroke	Charles Hassall					
Radnor	John Clark					
North Wales incl. counties of Anglesea Caernarvon Flintshire Montgomeryshire Denbighshire	George Kay		1810	Rev. Walter Davies	£75	
South Wales			1814	Rev. Walter Davies	£150	

SCOTLAND

County	1794 General Views		Corrected Reports			
	Surveyor	Cost surveying	Date	Surveyor	Cost surveying	Printing
Aberdeen	James Anderson		1811	George Skeene Keith	£200	
Argyll	James Robson		1805	John Smith		
Ayrshire	William Fullarton pubd. 1793		1811	William Aiton	£150	
Banff	James Donaldson		1812	David Souter	£105	
Berwick	Alexander Lowe		1813	Robert Kerr	£200	
Bute			1814 1817	William Aiton Fleming	£60 £120	£46. 4. 0.
Caithness			1812	John Henderson	£150	
Carse of Gowrie	James Donaldson					
Clackmannan & Kinross	J.F. Erskine. pubd. 1795		1814	Patrick Graham	£140	
Clydesdale	John Naismith		1798 1806	Reprinted	£20 £20	
Dumbarton	David Ure		1811	Rev. A Whyte and D. Macfarlaine	£160	£50
Dumfries	Bryce Johnston		1812	Singer	£150	£100

SCOTLAND

County	General Views 1794.		Corrected Reports			
	Surveyor	Cost Surveying	Date	Surveyor	Cost Surveying	Printing
Elgin (Moray)	James Donaldson					
Fife	R.Beatson		1800	John Thomson	£20	
Forfar	Rev. M. Roger		1813	Angus Headricke	£160	£215.13.0.*
Galloway	James Webster	£30	1797	Heron (no evidence of publication) Smith	£20 £200	
Hebrides	Robert Heron		1811	James Macdonald	£300	
Central Highlands	William Marshall					
Inverness			1808	James Robertson	£200	
Kincardineshire (Mearns)	James Donaldson prtd. 1795		1810	George Robertson	£13.3.0	
Kinross	David Ure prtd. 1797	£40 /		See Clackmannan		

* including Orkney printing.

/ including £30 jointly for Stirling.

SCOTLAND

County	General Views	Cost	Corrected Reports		Cost	
	Surveyor	Surveying	Date	Surveyor	Surveying	Printing
E.Lothian	Geo. Buchan Hepburn		1805	Robt. Somerville re-issue (Trotter)	£100 £50	
Mid. Lothian	Geo.Robertson pubd. 1793		1795	2nd edition		
W.Lothian	James Trotter		1811	re-issue	£50	
Merioneth-shire	George Kay					
Nairn	Jas.Donaldson		1813	Rev. Wm. Leslie		
Orkney				Sheriff	£245 *	
Perth S. Districts Carse of Gowrie	Jas.Robertson James Donaldson		1799	Jas.Robertson	£60	
Renfew.	A. Martin		1812	John Wilson	£50	
Ross-shire			1810	Sir Geo. Stuart Mackenzie	£160	£21.8.0.
Roxburgh Selkirk	David Ure Thos.Johnston		1798	Robt.Douglas	£38.4.5.	

* including Orkney printing.

SCOTLAND

County	General Views			Corrected Reports		
	Surveyor	Cost Surveying	Date	Surveyor	Cost Surveying	Printing
Stirling	David Ure (uncertain if published) R.Belsches pubd. 1796	*	1798-1800 1812	Wilson Patrick Graham	£30 £100	 £117.5.0d.
Sutherland			1812	John Henderson	£100	
Tweedale (~~Publishire~~) Peebleshire	T.Johnson		1802	Rev. Charles Findlater		

* including £30 jointly for Stirling.

APPENDIX 5

AGRICULTURAL SOCIETIES IN 1810

ENGLAND AND WALES

as printed in the Bath and West Papers. 1810 XII p. 396.

Society	Meeting Place	President	Secretary
Board of Agriculture	London	Sir John Sinclair	Arthur Young
* Bath & West	Bath	Benjamin Hobhouse	R. Ricards, Esq.
* Bedford	Bedford	(Duke of Bedford in 1803)	
* Berkshire	Ilfley		
Boston			
Brecon	Brecknock		
Carmarthenshire	Carmarthen		
Caernarvonshire			
Cardiganshire	Cardigan		
* Cornwall			(Mr. Wallis of Bodmin, 1803)
Christchurch (Hants)	Christchurch		
Chesterfield (Derby)	Chesterfield		
* Derby West	Derby		(Mr. Wm.Stannistreet, 1803

* Societies included in a list of 1803 printed in the Annals. vol. 40, p. 476

Society	Meeting Place	President	Secretary
Devon	Totnes	Paul Treby Treby	
Drayton	Drayton	Sir John Hill	Thomas Dicken
* Durham	Darlington	Sir H.V. Tempest, Bart.	Mr. Ornsley
Essex	Chelmsford	Lord Braybrook	Mr. T. Cawbell
Glamorganshire	Cowbridge		
* Herefordshire	Hereford	Earl of Bridgewater	
Hertfordshire	Berkhamstead	" " "	Mr. Nicholson
Holderness	Hedon	Thos. Thompson, Esq.	Mr. A. Stovin
Howden	Howden		
* Kent	Canterbury	Wm. Honeywood, Esq., M.P.	Mr. Jacob Sextries
* Lancaster			Rev. J. Stainbank
* Leicester		Earl of Moira	
" and Rutland	Leicester		
London Society of Arts	Adelphi		
* Manchester, inc. Cheshire	Manchester in August. Altrincham in October.	Earl of Stamford and Warrington	Mr. John Ashworth

* Societies included in a list of 1803 printed in the Annals. vol. 40, p. 476

Society	Meeting Place	President	Secretary
* Newark, Notts.	Southwell	Sir R. Sutton	
* Newcastle North	Newcastle	Sir Wm. Lorraine	Rev. Mr. Turner
* Norfolk	Lynn & Norwich	T.W. Coke, M.P.	Rev. Mr. Priest
Pembrokeshire	Norbeth & Haverford West		Charles Hassall
Penlynn & Endernion			
Petersfield, Hants		Sir Thomas Miller	Mr. Lipscombe
Shiffnall	Shiffnall	Joshua William	Mr. George Bayliss
Staffordshire	Lichfield	Lord Bradford	William Bond
Smithfield Club	London	Duke of Bedford	Mr. Farey
Surrey	Reigate, Guildford, Dorking		Morris Birkbeck
* Sussex	Lewes	Earl of Egremont	Mr. J. Gell
Tyneside	Newcastle	Sir William Lorraine	Mr. Lawes
Wharfedale	Otley	Sir H. Carr Ibbetson	Mr. Jenkinson
* Wyveliscombe		Lord Somerville	Mr. Hancock
Woburn			

* Societies included in a list of 1803 printed in the Annals. vol. 40, p. 476

Society	Meeting Place	President	Secretary
Workington	Keswick	J.C. Curwen, M.P.	
Wynnslay (Denbigh)	Wynnslay	Sir W.W. Wynne	
York	York		Mr. Daniel Tuke

SCOTLAND

Society	Meeting Place	President	Secretary
* Highland	Edinburgh	Duke of Athol	Donald Macklacklan
* Banff		William Rose	Mr. Brand
Badenock & Strathspey	Kingussie	Duchess of Gordon	Rev. Mr. Anderson
Carrick Ayrshire	Merghole		
Clydesdale	Lamarck Muir	William Bertram, Esq.	
Dalkeith	Dalkeith		Mr. Wm. Douglass
Dunichen			George Dempster
Eddlesham			Dr. Patrick Robertson
Fife	Cupar of Fife		Mr. Niel
Inverness	Inverness		Mr. John Young
Kilmarnock	Kilmarnock		
Lanarkshire			Mr. John Galvin
Lothian - Linlithgow			
Middleton			Mr. Alex. Innes

* Societies included in a list of 1803 printed in the Annals. vol. 40, p. 476

SCOTLAND

Society	Meeting Place	President	Secretary
Morayshire	Elgin		William Young
* Perth			Mr. Wallace
* Ross-shire Association	Dingwall	Sir George Mackenzie	
Wigtonshire	Wigton	Rev. J. Stevens	Mr. George; Mr. Hassie;

* Societies included in a list of 1803 printed in the Annals. vol. 40, p.476